Composing Doggerland:
How can the North Sea inform new approaches to situated arts practices in the context of the Anthropocene?

R Smith

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Composing Doggerland: How can the North Sea inform new approaches to situated arts practices in the context of the Anthropocene?

Rob Smith

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Abstract

Composing Doggerland: How can the North Sea inform new approaches to situated arts practices in the context of the Anthropocene?

This practice led Fine Art investigation of the North Sea develops new approaches to situated arts practices within the context of the changed relationships between humans and the environment, proposed by the Anthropocene.

The proposition of this new geological epoch suggests an un-grounding of the Earth, where ‘Nature’ can no longer provide a stable background for human actions, demanding alternative narratives of human interactions with the planet. By bringing human histories into proximity with geomorphic change, the North Sea makes these complexities apparent, and calls for new approaches to a site that becomes delocalised, mobile and distributed across different temporal and spatial scales.

Through my artworks, this research proposes a speculative methodology to address the North Sea as a complex assemblage of human and nonhuman actants. It approaches the North Sea through the vibrant materiality of Jane Bennett (2010) and explores ideas of composition put forward by Bruno Latour (2010, 2014) and Donna Harraway (2016), to expand spatial understandings of site. By asking how sites emerge within the material interactions of an assemblage, this research offers insights into how multiple sites of the North Sea are composed in time, engaging with its historic past as Doggerland, the methods and technologies through which it becomes apparent today, and possible futures that are proposed in the context of rising sea levels and the end of North Sea oil production.

This thesis develops original understandings of a distributed site within which agency is shared across multiple actants; moving from a singular representation of the North Sea, towards a situation in which multiple instances of it are composed temporarily, before being recomposed into new sites. As such, this thesis argues that a site can no longer be understood as a spatially limited local concept. Instead it is realised as a generative position that presents an effective way to investigate the animated interrelations within the assemblage of the North Sea, that can inform new understandings of site in the context of the Anthropocene.

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Acknowledgements

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A special thank you goes to my partner Sophie Buxton for her encouragement, unwavering support and patience throughout this research and particularly for her proof reading in the last few weeks. Thank you also to our children who have been equally patient and are just awesome ;-) B-) :-P

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas and contributions from the work of others.

The Word Count of this thesis is 39721words

Rob Smith
Signature:

Part 1: Documentation of Artworks

NorthStudioMoonSea 2017-2018
sea water, electronics, projection, arduino microcontroller, plastic bags, concrete, astronomical tripod mount, photographic backdrop paper, monitor, cables, copper, zinc, trolley, mirror, shelving unit, computer and custom software

NorthStudioMoonSea installed at Baltic39. Newcastle, 2018

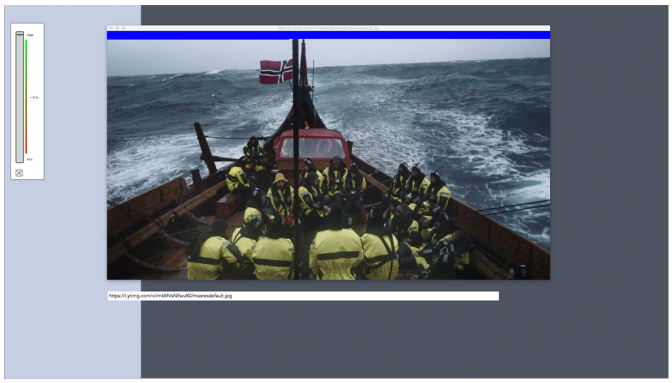
NorthStudioMoonSea installed at Baltic39. Newcastle, 2018

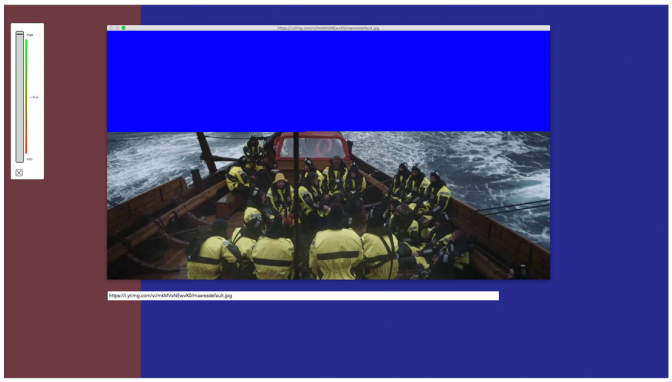
A changing field of colour is reflected from a mirror, tracing a path across the space of my studio, highlighting the elements of the apparatus that compose this work. The mirror is mounted on an astronomical telescope mount that is programmed to track the position of the Moon. It constantly moves to an unseen body and points to a horizon beyond the walls of the space.

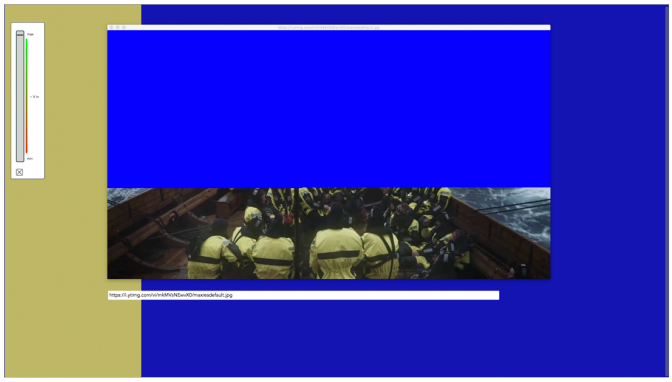
NorthStudioMoonSea is an artwork that connects the architecture of my studio, with an expanded site of the North Sea. It is an assemblage of things; bags of sea water, electrical currents, zinc and copper electrodes, projections, the orbit of the Moon, computer, cables, concrete, some dolly wheels, multiple images of the North Sea distributed through the internet and the position of the moon. It is a set of processes and materials which are both interrelated and contingent. These materials each have different effects at differing scales within the programme of the work, as the computer scrapes images from the internet using the search term ‘North Sea’ and then breaks them into their constituent pixels and redistributes their colours within the space of the work.

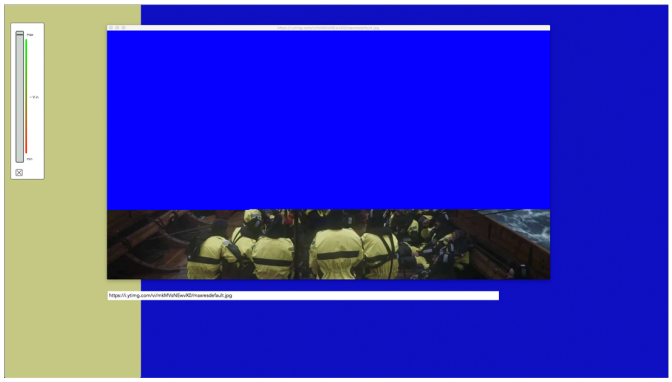
The speed at which the image is pixelated varies with the electric current generated between copper and zinc electrodes immersed in salt water contained in the plastic bags.

More information: http://robsmith.me.uk/northstudiomoonsea.html



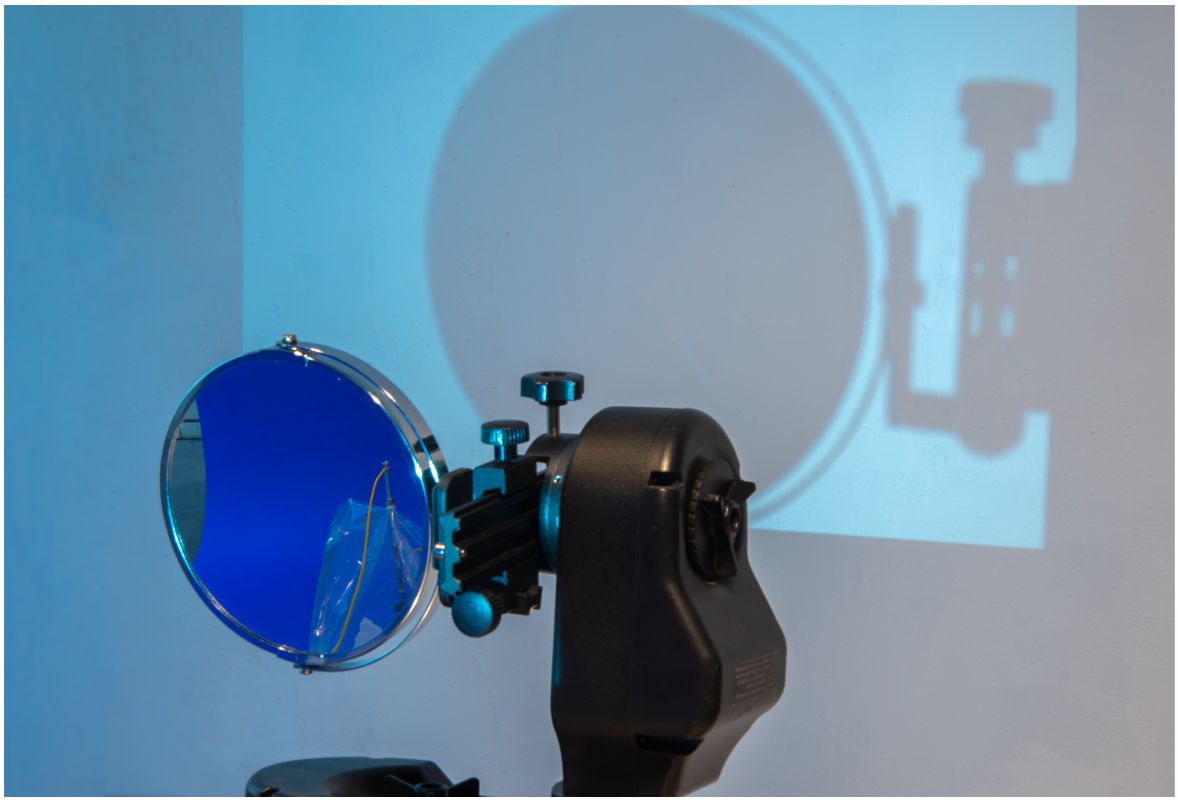






The monitor in the installation displays randomly selected images automatically downloaded from Google using the search term ‘North Sea’. The software then samples the colour of each pixel in the image, working from the top left of the image to the bottom right and the colour of each pixel is projected as a full frame image from the projector.

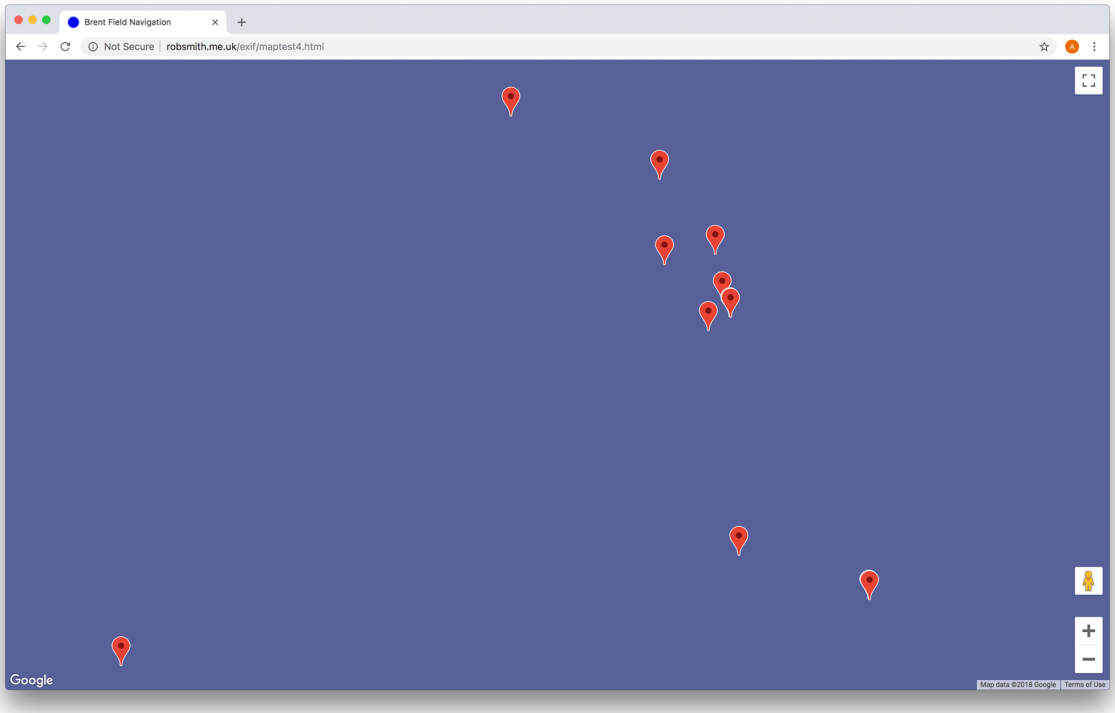
Once sampled the pixel is replaced by a blue one so that the image is gradually reduced to a blue monochrome. The speed of this process is controlled by the voltage generated in the bags of salty water.



Detail of *NorthStudioMoonSea* showing mirror mounted on astronomical tripod head, tracking the position of the moon

Detail of *NorthStudioMoonSea* showing electrodes in bags in of salt water generating electric current the affects the speed of the pixilation

Brent Field Navigation 2017-ongoing
Customised Google Map, data, digital images

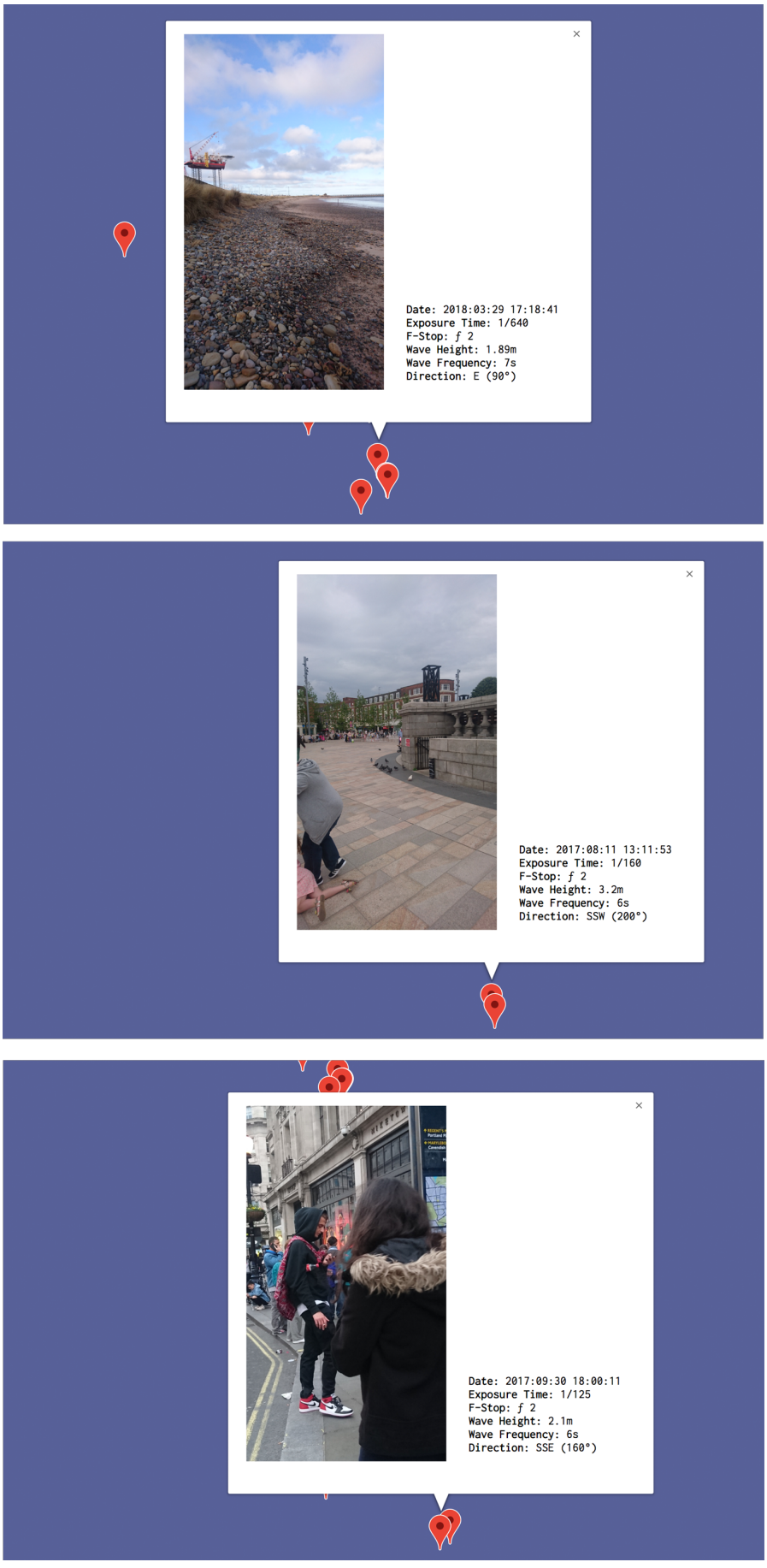


Screen shot showing map from *Brent Field Navigation*, accessed December 2018

Brent Field Navigation presents an ongoing collection of images taken while I am oriented in the direction of the Brent Alpha oil platform in the North Sea at the GPS co-ordinate 61.000ºN 0.708ºE.

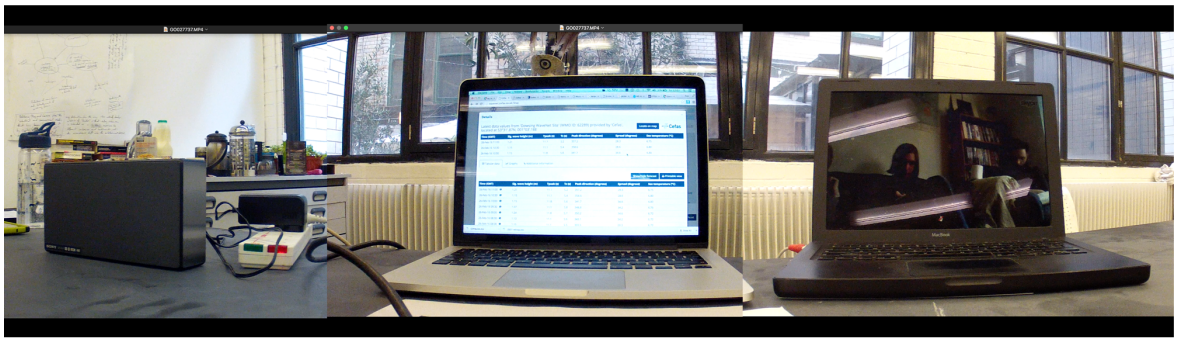
These images are uploaded to a server and while they are, environmental data from a wave buoy at the Brent Platform; wave height, direction and frequency, is added to the metadata of each photograph; f-stop, exposure time, date stamp. The image is then added to a customised google map with the additional data, using the GPS location data of where the image was taken to position it as a pin. All the other information has been removed from the Google map interface and it has been coloured to the uniform blue that Google uses to represent the sea. Over the course of this research the points have accumulated on the map, changing the composition of the array of data with each point that is added.

The map can be accessed at: http://robsmith.me.uk/exif/maptest4.html



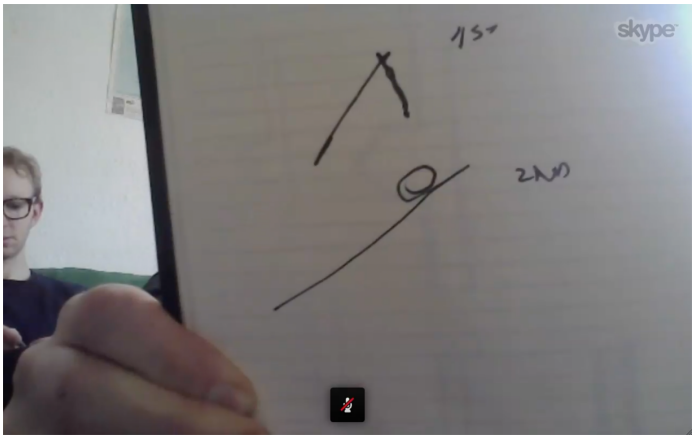
Screen Shots showing a selection of images from *Brent Field Navigation*

Data Buoy (Remote Viewing) 2016
Coordinate Remote Viewing Session. Carried out by Ralph Dorey and AAS.



Montage of images from video of space at Baltic39 where the session was monitored

Members of AAS during remote viewing



Ralph's first ideogram of the target site

Remote Viewing is a method for visualising a site at a distance using parapsychological means. This Remote Viewing was carried out with the artists collective AAS and the target for the session was a data buoy monitoring environmental conditions in the North Sea. A group of researchers were gathered in a studio at Baltic39, Newcastle and were connected to the remote viewers who were in London via a one way skype connection so that the session could be monitored. The following pages gather some of the impressions from the session.

Talk us through the model?

Right, so…

I feel like I should... Imagine human scale to be about the size of the lighter. That is human scale, but it isn't a person. The lighter isn't a person; it is maybe some kind of ornamental thing that is for redirecting people through the space. It could be a stone block with a plant pot on it or something like that but it is about… it cuts up the space.

These things could be [pointing to the books laid down in the foreground], are like, kinda' like stone forms. They are probably combinations of things so they have like different functions, they might break up the space, stop people moving through but could also like be softened by… there might be seating areas or something. It might be the sort of thing where you can get information or you can buy something. But their main purpose is to break up the space.

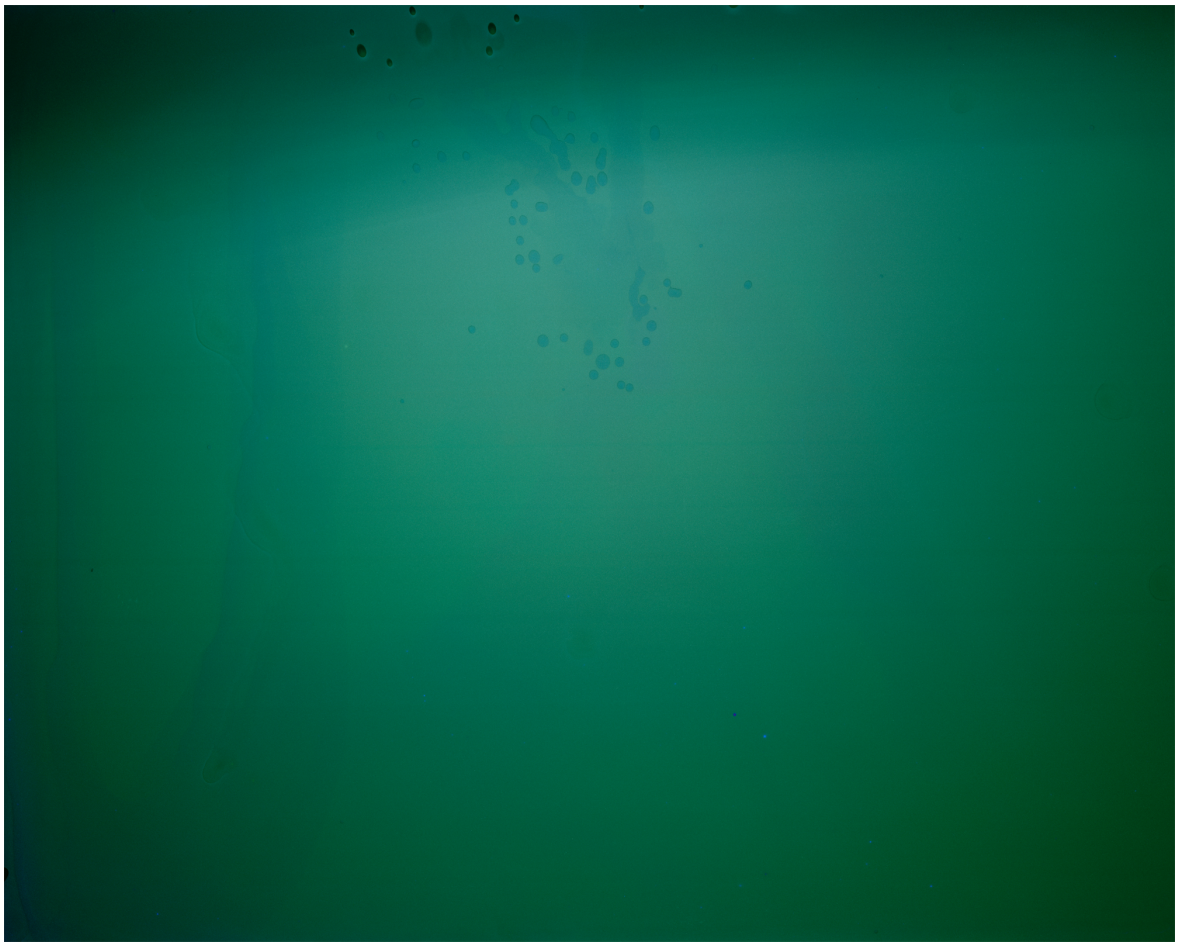
Umm, that is this one and this one um. [pointing again] They are vague, what they look like they are there to do. They don't advertise their presence they are quite discreet. Whereas these things [pointing to the pair of vertically arranged blocks] are, kind of… I don't really know. They're… they're definitely meant to display something quite authoritative, they are symmetrical in the space. Definitely symmetrical in the space, kind of columns, or, they might not even be solid something like flags or something but they are very , where as these are discreet , these are very much meant to be directing you when you come in. I imagine you enter the space somewhere back here and you come in and it is rising up at the back.

This feels like [gesturing to the toilet paper draped at the back], these are the soft moving fabrics that I imagined at the beginning it could be kind of hangings or a banner or… or it might be flags. It might be something stuck to the wall that is just moving incidentally or like something that is meant to be moving. Umm this is a kind of solid wall at the back but it has glass in it, uur, you can go through it, this whole thing is like a threshold. Going through from softer to harder. It might stop you at any point here, before you are allowed to come through here. It is a very controlled space; at the same time, it is not trying to be directly adversarial but ultimately it is rigid.

Can you hear me? (Laughs)

Model produced during the remote viewing session 26 February 2016.
Remote viewing by Ralph Dorey and AAS

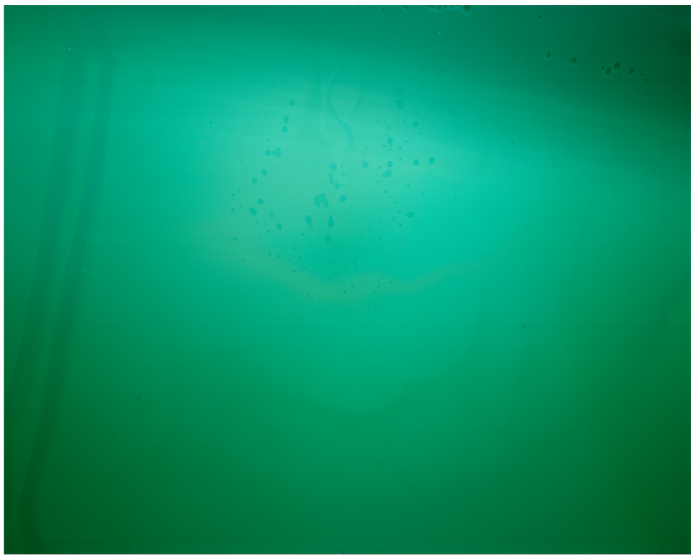
Instances of Drift 2017-18
Underwater Pinhole Photographs, c-type print

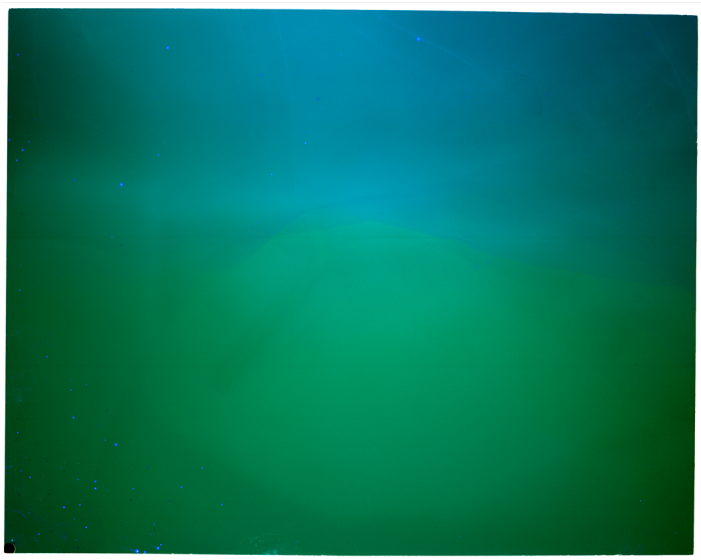


Instances of Drift 2018. C-type print 137 x 108 cm

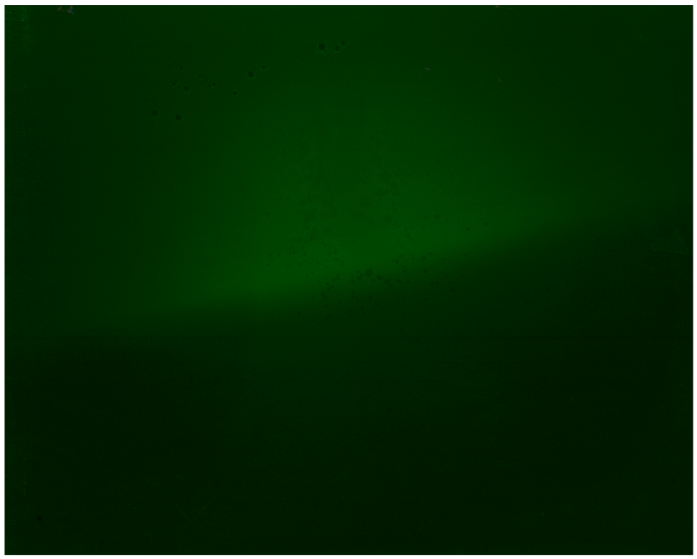
A series of underwater photographs produced using a pinhole camera mounted with a 5x4 film holder. The camera was immersed in the North Sea suspended from a buoy, and the aperture of the pinhole allowed both water and light into the apparatus to affect the photographic film and create the images.

More information: http://robsmith.me.uk/drift.html



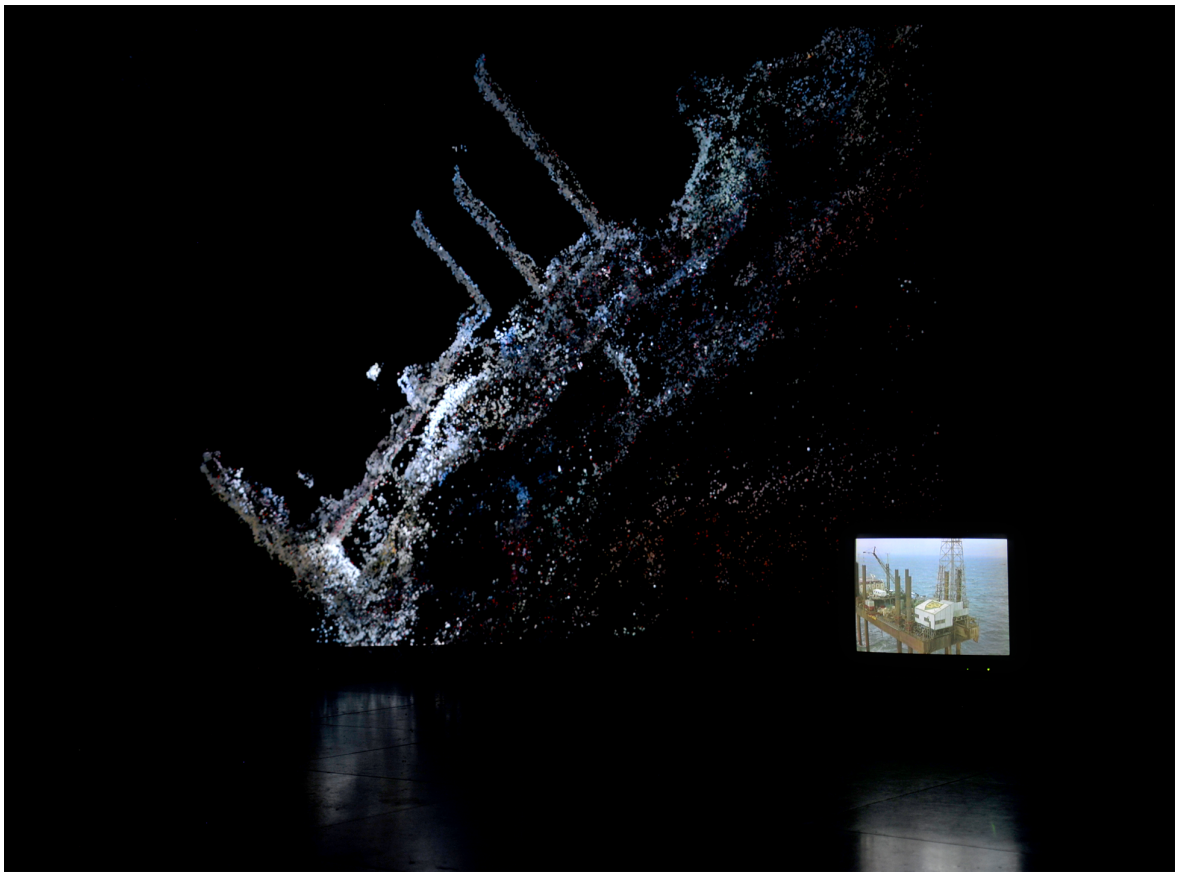


Instances of Drift 2017-18. Underwater Pinhole Photographs. c-type prints. 137 x 108 cm



Instances of Drift 2017-18. Underwater Pinhole Photographs. c-type prints. 137 x 108 cm

Sea Gem [1965-now] 2018
custom software, 3D model and archive video with sound



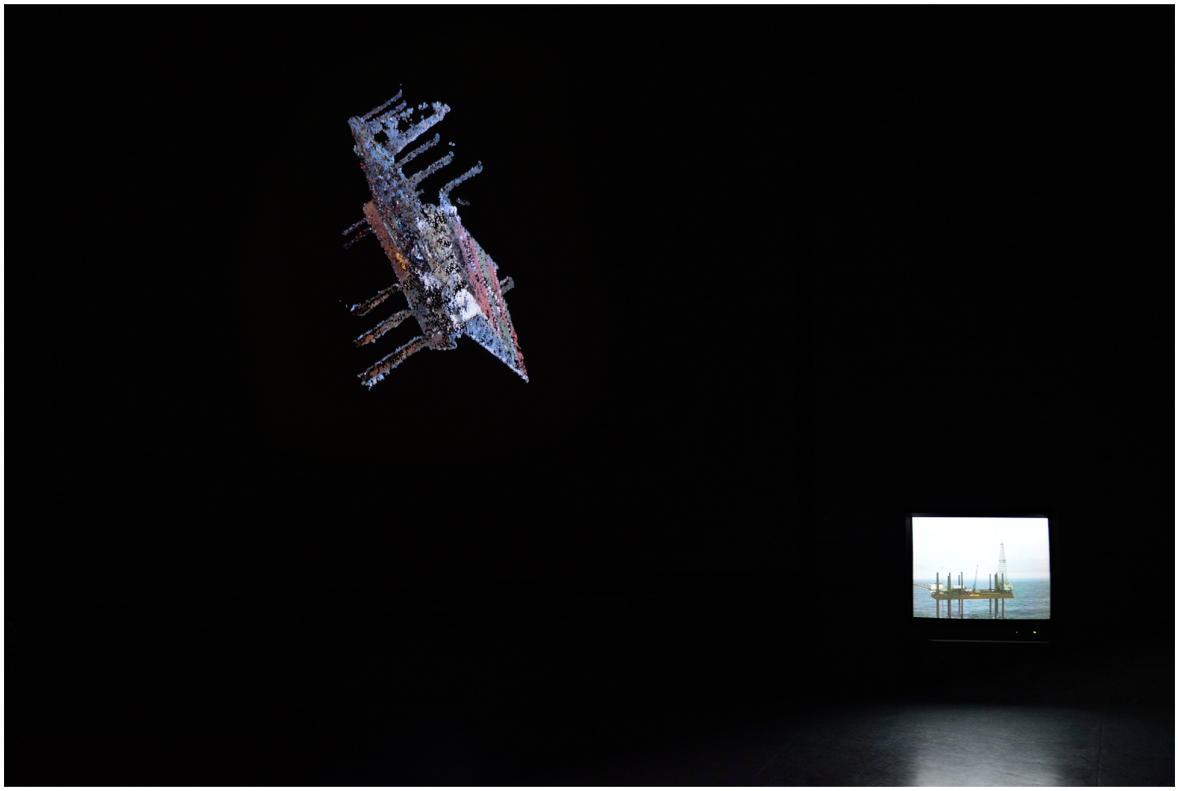
Sea Gem [1965-now] Installed at Northern Charter 2018

A 3D digital model of the Sea Gem, a sunken exploratory drilling rig, has been reconstructed from an archive newsreel film from 1965, using a process of photogrammetry. This model is projected as a point cloud (the raw spatial and colour data from the process) and is continually animated using custom software.

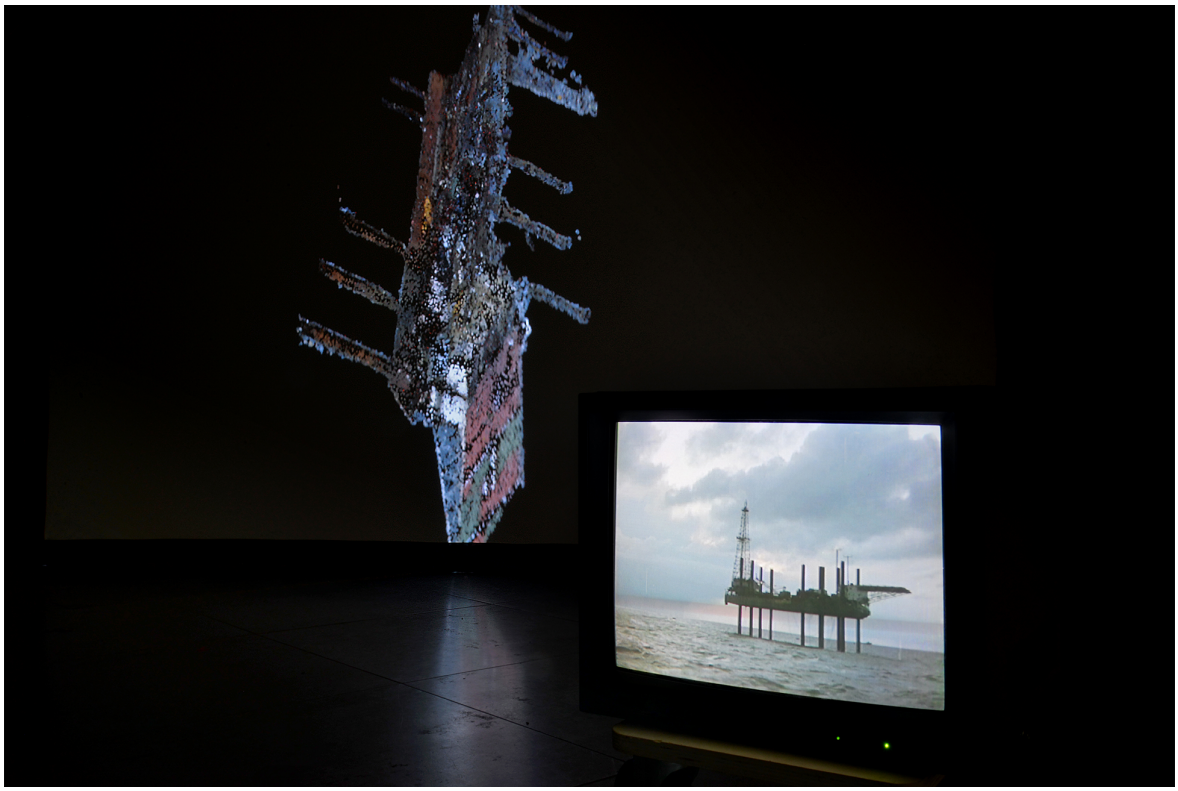
This software determines the virtual camera position through which the model is seen. The point-of-view moves around and through the points that make up the model, its motion and speed being determined using wave data from a data buoy positioned near the wreck site in the North Sea. The orientation of the model is additionally determined using the position of the moon so that it rotates with its orbit. These combine to present a constantly changing and infinitely variable encounter with the work.

The newsreel footage from which the model of Sea Gem was produced, is presented alongside it on a CRT monitor. The playback rate of the video is linked to the movement of the model on the screen. As the movement of the model in the projection increases and decreases, so does the speed of the video; changing it from a slow stepping between frames to a blur of images. The soundtrack of the film is likewise adjusted and moves between a low drone and a high pitch slurring as the playback speed varies.

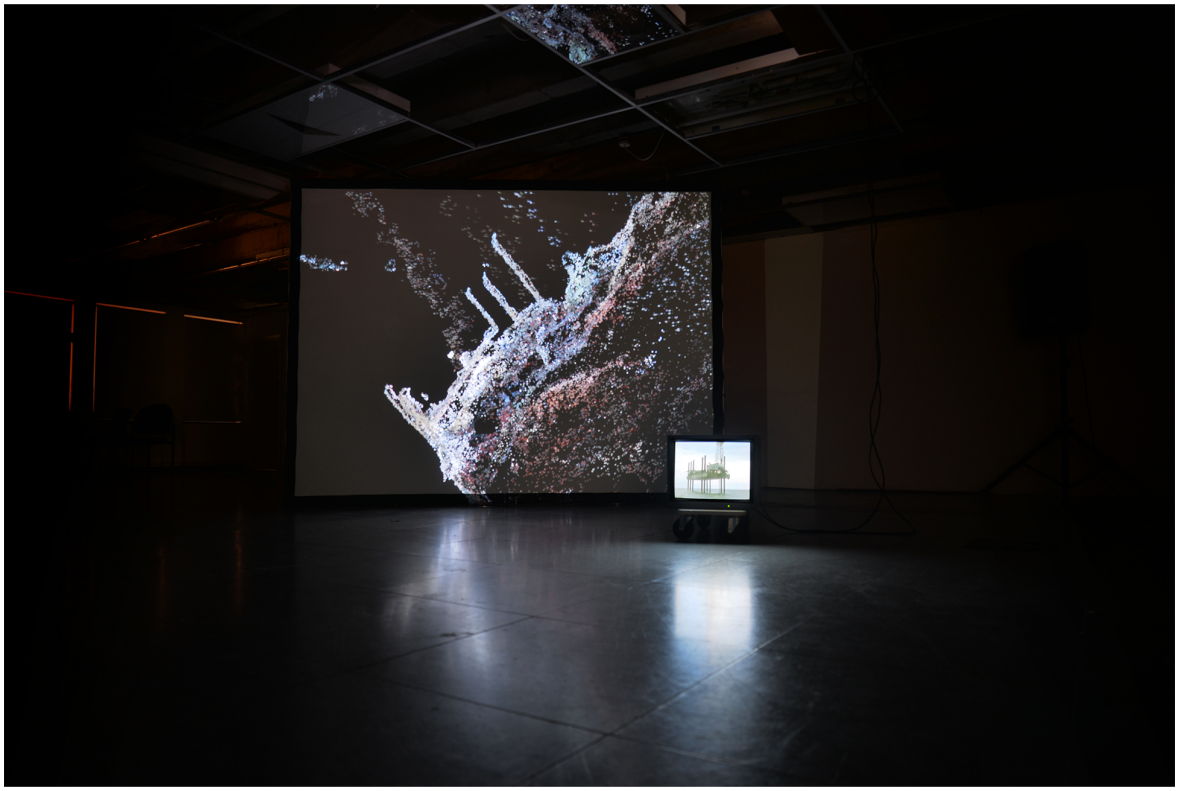
More Information: http://robsmith.me.uk/reef.html
Archive video footage: https://www.youtube.com/watch?v=SRM3LPelhLM



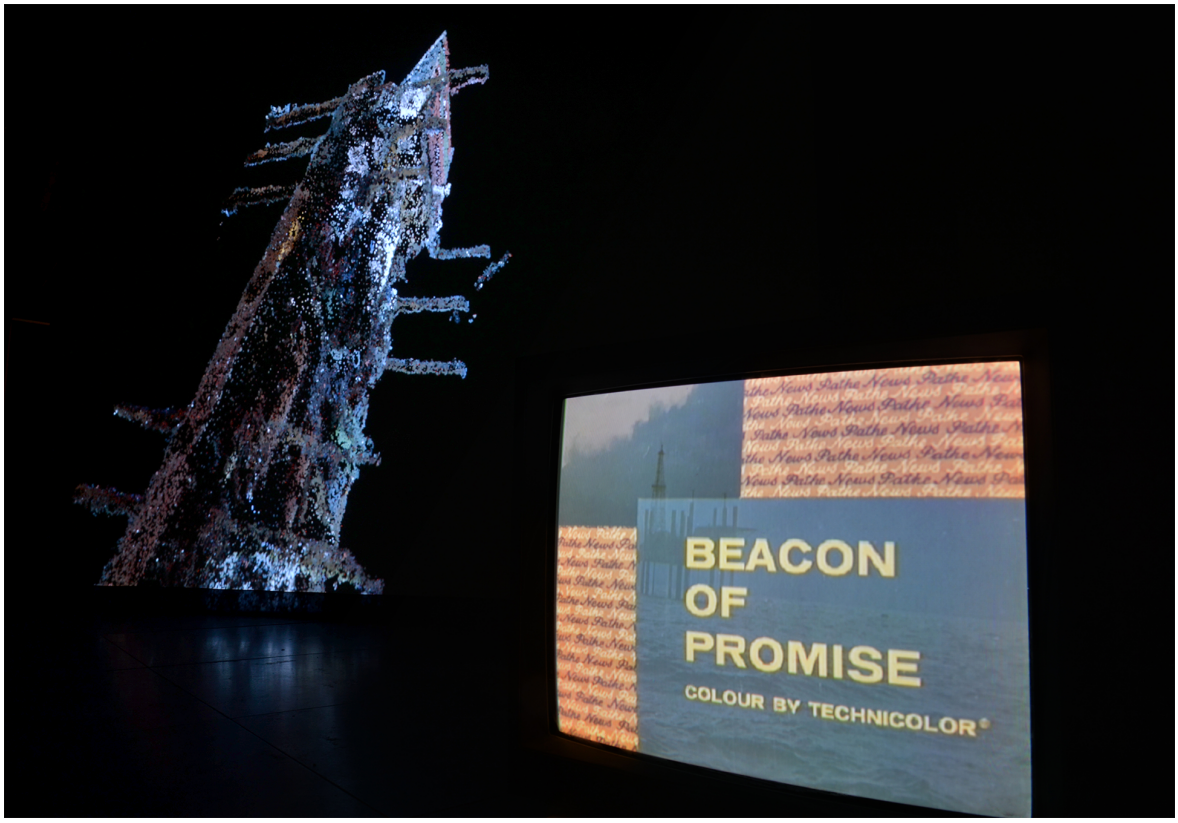
Sea Gem [1965-now] Installed at Northern Charter 2018



Sea Gem [1965-now] Installed at Northern Charter 2018

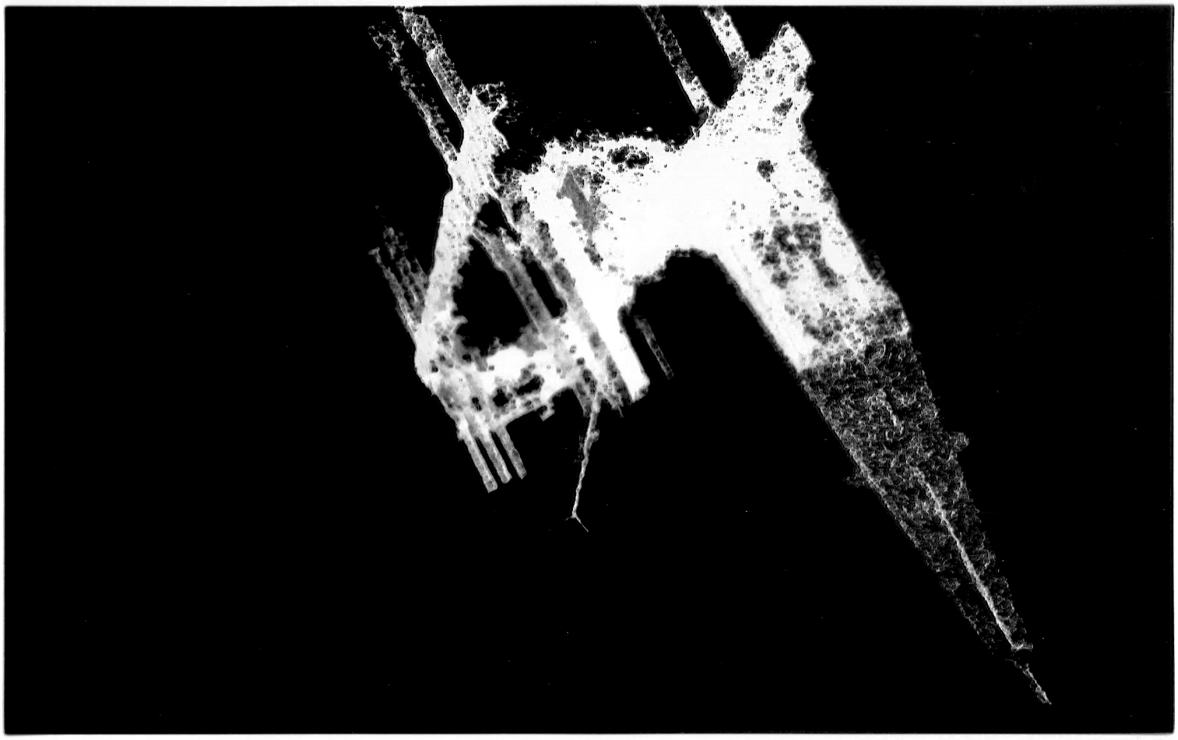


Sea Gem [1965-now] Installed at Northern Charter 2018



Sea Gem [1965-now] Installed at Northern Charter 2018

Sea Gem: Screen Contact 2018
Black and White Photographic prints



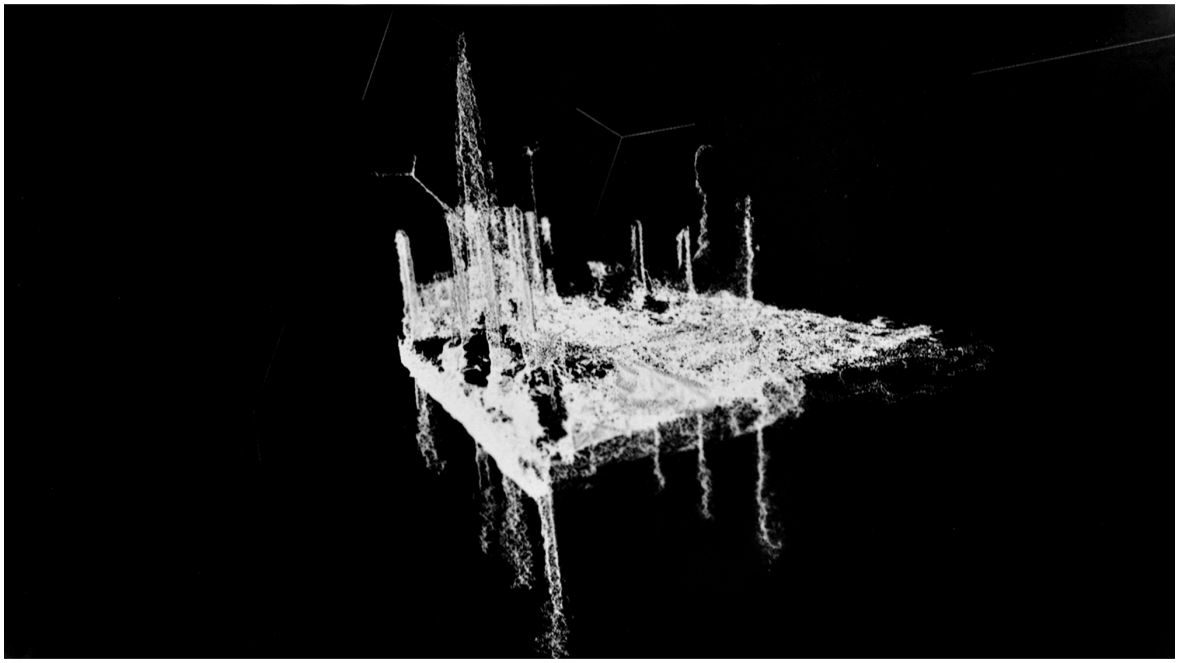
Sea Gem: Screen Contact 2018.(Macbook pro 13") 28.7 x18cm

These works are produced using a method of contact printing directly from different computer screens. The dimensions and qualities of each image are defined by the screen that it is printed from.

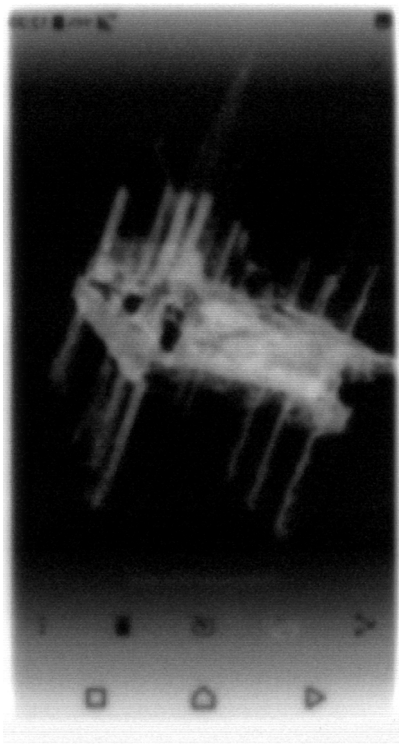
The screens displayed images of a point cloud from a 3D model of the exploratory North Sea drilling rig *Sea Gem. The model was* constructed using a process of photogrammetry sourcing images from archive newsreel footage shot before *Sea Gem* sank in 1965.

More Information: http://robsmith.me.uk/reef.html

Sea Gem: Screen Contact 2018
Black and White Photographic prints



Sea Gem: Screen Contact 2018. Samsung 32” TV 71 x 39 cm



Sea Gem: Screen Contact 2018. Sony Xperia Z5 Compact 6 x 10.4 cm

Part 2: Commentary

Introduction

This enquiry asks how a consideration of the inundated landscape beneath the North Sea can inform new understandings of situated arts practices in the context of the Anthropocene. It is an investigation that is immediately complicated by the material conditions of the sea. The North Sea's inaccessibility does not allow for the same experience of being present as terrestrial sites; a presence that has historically grounded site-specific practices and provided an anchor for the relationship between artwork and site[1]. I propose that the North Sea does not offer a specific phenomenological site, but instead provides a problematic context through which this research questions established methodologies of site-oriented practices, and seeks to develop new ways of working that can inform new understandings of situated arts practices.

Since the 1960s, arts practices have moved out of the gallery to occupy an 'expanded field' in which site-oriented practices proposed a counter position to that of the 'placeless' sculptural objects of modernism (Krauss, 1979, pp.32-44). It is an expansion that has continued a trajectory away from singular, indexical relationships between artwork and site towards what James Meyer describes as a 'functional site' (Meyer, 2000, pp.24-25). This is an idea of a site where 'physical place' is not privileged, and texts, photographs and video contribute to an 'informational' idea of site that becomes mobile, no longer fixed to a single physical location (ibid, p.25). Miwon Kwon suggests this change means that a site is not defined as a precondition to an artwork, but is generated by it, a 'discursively determined site' that can occupy multiple physical locations and cross disciplinary boundaries as 'a field of knowledge, intellectual exchange, or cultural debate' (Kwon, 2002, p.26). It is from these expanded understandings of site that I approach this research and ask how the proposed geological epoch of the Anthropocene can further evolve a comprehension of site, not as a self-evident local condition, but as something that is assembled or composed.

[1] James Meyer argues that the premise of early site specific practices made a demand for 'an experience of being there' (Meyer 2000 p.26). Similarly, Miwon Kwon 2002 suggests site specific practices were 'obstinate about presence' (Kwon 2002 p.11) - a position that underpins indexical relationships between artwork and site.

The proposal of the Anthropocene suggests that the effects of human activities on the planet are now of such scale that they can be considered to characterise a new geological epoch (Crutzen & Stoermer, 2000). Geological studies have since looked for material markers of human effects on the planet: radionuclides; plastics; techno-fossils; increased levels of nitrates, phosphates and heavy metals in the soil, all contribute to the clear delineation that significant geological changes caused by human actions can be recorded in the stratigraphic record of the planet (Waters et al, 2016). As this evidence of human impact on the planet raises questions of environmental responsibility, it simultaneously un-grounds human relations *to* the world and infers instead that humans are an inseparable part of its interrelations. This change in relations destabilises binary positions of nature and culture- the idea that humans can be distinguished from nature, that has defined modernity (Latour, 2017, pp.14-15)- while undermining the certainty of idealised 'Nature'[2] as an ontological realm (Morton, 2010, pp 30-31). Without nature as an organising concept, human cultures now face the task of reorienting their position in a relational space where knowledge of the world must be conceived through its interconnections (Morton, 2010, pp.28-30) and understood as composed and as readily re-composed (Haraway, 2016, p.97).

Doggerland is the name that was given to the once inhabited land that connected Britain and Europe by Bryony Coles (1992), and which now lies beneath the waters of the North Sea. In this thesis Doggerland provides a conceptual framework for approaching the interrelationships that compose the contemporary North Sea in the context of the Anthropocene. Its transition from land to water was not a distant *pre*historic event but one that brings human histories into proximity with significant geomorphic changes. Doggerland did not disappear under the surface of today's North Sea until approximately 5500BCE, and sea levels in the North Sea are continuing to rise. As such neither Doggerland nor the contemporary North Sea can be understood as a static landscape or self-evident background against which human histories can be oriented. Instead, together they suggest a mobile and continuously transforming site, one that does not emphasise

[2] Timothy Morton suggests that the word Nature could be capitalised to highlight its 'unnatural qualities' (2010 p.3)

a fixed topography, but emerges from the interrelations of the histories and materialities from which it is constituted.

Situating the practice that has led this enquiry within this expanded understanding of the North Sea, I have approached it not as a singular, bounded location but a complex site of interrelations that is composed of multiple human and nonhuman actants, the vibrant and animated things that Jane Bennett suggests have agency (Bennett, 2010, pp.1-19). The artworks presented in Part 1 of this thesis (pp.1-20) have encountered salinity, waves, scientific instruments, people, me, water, oil rigs, cameras, histories and other fictions. They have produced new situations, where these things are made apparent, their interrelations and interactions addressed, and from which I suggest multiple new sites of Doggerland are composed. It is through these multiple meeting points, these sites of convergence, that I contend new knowledge of Doggerland and the contemporary North Sea emerges, and through which situated arts practices can inform new approaches to understanding the changed relationships between humans and the environment implied by the Anthropocene.

This second part of the thesis (pp.21-131) begins by laying out the critical framework for this research, situating Doggerland within the context of the contemporary North Sea and the Anthropocene. Alongside this, I also introduce the ideas of Bennett (2010) and Latour (1993) who both argue for an agency of things, an idea that informs my approach to the ways in which nonhumans can contribute to a discursively produced site.

Chapter 1 explores the possibilities of expanding contemporary understandings of the North Sea beyond the confines of its geographic boundaries and the undifferentiated space presented by cartographic representations of it. Through discussion of the development of the artwork *NorthStudioMoonSea* (2017-18), I explore how my practice moved away from an idea of the North Sea as a singular location, to approach it as an assemblage; a collective of multiple heterogeneous actants, which through their collective and distributed effects offer an account of the effects of nonhuman agency (Bennett, 2010). I argue that by exploring the interrelationships between things in an assemblage, my artwork animates the

space between the different actants within it and multiplies the possibilities for new sites to emerge. Through a comparison of The Eames Studio's 1979 film *The Powers of Ten* with its re-making as Andrés Jaque's *Superpowers of Ten* (2013-16), I discuss how identifying discontinuities and difference allow for new animated actants to become apparent in the passage from the local to the global. This process expands the diversity of actants that contribute to the discursive production of multiple sites in the context of the Anthropocene.

Chapter 2 considers how the problematic material conditions of the sea: its inaccessibility, opacity and mobility; place an emphasis on the processes through which knowledge of landscapes is constructed and the role that technologies have in their composition. Through revisiting William Thompson's early underwater photographic experiments (1856, pp.425-426) and the production of my own underwater photographs using a deliberately leaky pinhole camera, I explore how new material assemblages are formed around the photographic apparatus immersed within the sea, reasserting the idea that places like the North Sea cannot be understood as a fixed topography viewed from an objective position, but are immersed in multiple interrelationships of human and nonhumans from which knowledge of them emerges. As geographer Jon Anderson (2014, pp.80-83) argues, places cannot be taken as self-evident but emerge from the convergence of multiple actants; meeting points in time and space from which a site emerges as a provisional and relational assemblage that is temporarily composed.

The final chapter discusses how an understanding of a site as a contingent and temporary composition of human and nonhuman actants, can inform current questions that are being raised over the best solutions to the decommissioning of offshore gas and oil infrastructures in the North Sea.

Through a practice led investigation into the exploratory drilling platform *Sea Gem,* which sank in 1965*,* I consider the wreck as a site through which the histories of the oil and gas industry in the North Sea can be explored. I approach the site through the convergence of human and nonhuman actants around it, suggested by the wreck's transformation into an artificial reef. The artworks created consider the temporality of the wreck site as it transforms and suggest a movement away

from an understanding of site as a position of fixed spatial relations towards an understanding of them as events. The concept of the event as used in chapter 3, draws on John Latham's concept of 'structure in events' (1984, pp.25-32) whereby he proposed that the world is composed not of objects in space but events in time. Through an exploration of his proposals for the *Niddrie Woman* (1975-76), that re-imagine the mountains of spent oil shale in Mid Lothian into new forms, I suggest alternative ways in which post-industrial sites can be understood so that they remain an animated part of the landscape and continue to be an active part of its composition into the future.

Doggerland presents a speculative situation to re-imagine the North Sea in the context of this research, and asks how it can inform new approaches to situated arts practices. Through the practice leading this enquiry, I explore Doggerland as a problematic context that needs to simultaneously account for two contradictory spatial conditions - water and land- as well as its capacity to change. Doggerland presents a site that I propose needs to be addressed through its interrelationships rather than its topography and as such can inform new understandings of the changing landscapes of North Sea in the context of the Anthropocene.

Critical Context

This section of the thesis draws from my initial survey of literature and lays out the critical context in which this research situates itself. I begin by giving a brief account of the development of contemporary situated arts practices; from the expanded field of Rosalind Krauss (1979) through to the positions of James Meyer (2000) and Miwon Kwon (2002) who develop an interpretation of site that moves beyond an indexical relationship between an artwork and site, to understand it as a discursive position engaging with a wider field of knowledge beyond its local conditions. Complementary to this, I discuss how the writing of Jane Bennett (2010) and Bruno Latour (2014, 2005,1993), offer ideas of nonhuman agency and ask how it might become distributed among multiple actants through an understanding of assemblage. This is a position that I suggest can contribute to new understandings of situated arts practices.

I then layout the situation of the contemporary North Sea in the context of the Anthropocene, and present Doggerland, not as an archaeological context, but as an expanded conception of a site from which this research can approach the North Sea. This framework brings together human histories in the context of geomorphic change and suggests that Doggerland is a site that cannot be understood as a self-evident background for human events but one that emerges from the interrelations of the multiple human and nonhuman actants that compose it.

0.1 Situated Arts Practices

Situated arts practices have a genealogy that can be traced back to the 1960s, when artists began to question the idea of the autonomous and bounded art object of modernism and the tabula rasa of the gallery in which it was presented. This shift in practices is described through Rosalind Krauss' essay *Sculpture in the Expanded Field* (1979). In this essay Krauss highlights the crisis within modernist sculpture at that time, suggesting that sculpture had become 'placeless' (Krauss, 1979, p.34), relating only to an idealised space of the gallery. Krauss argues that sculpture had become a negative entity defined only by what it was not, reduced to 'what was on or in front of a building that was not the building, or what was in the landscape that was not the landscape.' (ibid p.36) Krauss problematizes these

positions of ‘not-landscape’ and ‘not-architecture’ by including that which she asserts has been excluded from art since the renaissance - landscape and architecture. Through including these logically opposite terms in her ‘Klein diagram’, a multiplication of possibilities arises beyond *just* ‘sculpture’ to include ‘*marked sites’*, ‘*site construction’* and ‘*axiomatic structures’* (ibid p.38).

These dialectic processes synthesise new possibilities, where sculpture is no longer a single position suspended between static points, but becomes a part of a web of relations in which key historical site-oriented works like Robert Smithson’s *Partially Buried Woodshed* (1970) and *Spiral Jetty* (1970), Nancy Holt’s *Sun Tunnels* (1973-76), Robert Morris’ *Observatory* (1977), can be understood. By including what sculpture is *not* as well as what it *is*, Krauss’ arguments multiply differences to open relational possibilities between otherwise binary positions. This multiplication of the sculptural field into the expanded field of postmodernist arts practice is a key historical touchstone for artists’ practices extending beyond the gallery to encompass a wider field of engagement with site and one that also provides a position to begin to engage with Doggerland as a site that reaches beyond a localised geography into a more expanded form.

The move away from the gallery opened up the post-modern field of practice but also created new problems associated with how and where an artwork is situated. Miwon Kwon describes how site-specific art has been ‘obstinate about presence’, insisting on a relation to an ‘actual location, a tangible reality, its identity composed of a unique combination of physical elements’ (Kwon, 2002, p.11).

It is an approach that forms an indexical link between the artwork and the site, one that is highlighted as problematic by both Kwon and James Meyer (2000) through the example of Richard Serra’s site-specific artwork *Tilted Arc* (1981). After the installation of Serra’s curving Corten steel wall across a New York plaza, public opinion moved against it and a court case followed to have the work removed during which Serra claimed that to remove the work is to destroy it (Kwon, 2002, p.12). This inseparability of an artwork from the physical site, refered to by Meyer as the ‘literal site’ (Meyer, 2000, pp.24-25), is used by both authors to show the limits of privileging physical place within site-specific practice. This literal

conception of the site through insisting on its indexical relationship to a physical location, closes possibilities for institutional critique, social and political engagement through site. Kwon argues that this position curtails the possibility of 'generating new identities and histories' (ibid, p.165). Meyer proposes a second more generative model of site, *the functional site*, one that moves towards an informational idea of site, one located in the informational and textual filiations between sites. The functional site refuses the intransigence of an 'obdurate steel wall', to become 'a temporary thing, a movement, a chain of meanings and imbricated histories: a place marked and swiftly abandoned' (Meyer, 2000, p.25). This 'vectored' site that Meyer proposes is reflected by Kwon who writes; 'It seems historically inevitable that we will leave behind the nostalgic notion of a site and identity as essentially bound to the actualities of a place' (Kwon, 2002, p.164).

Moving away from what Kwon describes as a phenomenological conception of site, she uses the example of Mark Dion's *On Tropical Nature* (1991) to describe a discursive idea of site (ibid p.26), an idea that suggests ways of understanding site as dislocated and mobile. She highlights the different sites that are active within Dion's work; the 'uninhabited' rain forest where he collected specimens, the gallery where he displayed them, the curatorial framework of the group exhibition it was displayed in, and finally and as Kwon highlights the 'least material' site; the 'discourse concerning cultural representations of nature and the global environmental crisis' (ibid p.28). Through these processes the artwork's relation to a location and the 'social conditions' of its institutional frame 'are both subordinate to a *discursively* determined site that is delineated as a field of knowledge, intellectual exchange, or cultural debate' (Kwon, 2002, p.26).

The material site is superseded by the vectors of overlapping fields of discourse, where the site can be understood to be more complex than a topographical entity, or locally contained set of issues, to include a diversity of new discursive sites that cross interdisciplinary boundaries of anthropology, political theory, architecture, urban planning, cultural studies, and engage with a gamut of issues from sexuality and gender, to histories of colonialism and racism.

As *site* as a location recedes, so the more complex idea of a 'situation' emerges.

Situation is a term often associated with Claire Doherty who points to the 'dissatisfaction…[of]… practitioners, commissioners and critics' with the term, 'site specific' (Doherty, 2004, p10). Through her role as director of Situations (2002-17), she commissioned works and supported practices that developed new approaches to situated artwork. For example, Heather and Ivan Morrison's *I Lost her near Fantasy Island. Life will never be the same…* (2006), presented a jack-knifed lorry in a public space in Bristol, spilling flowers across the street which passers-by took away, reconfiguring the work by distributing the flowers throughout the city. Alex Hartley's *Nowhere Island* 2012 saw a mobile 'nation' travel around the South Coast of Britain during the Olympic Games and Michael Sailstorfer's *Folkstone Digs* (2014) brought crowds of people to the beach to dig for buried gold. These works all form complex new relationships through which their sites become dispersed through the participation of the public with the artwork and the potential of the discursive space that is produced around it.

The discursive, situation-producing approaches of Kwon and Doherty both offer ways in which indexical relationships between artwork and site are superseded by more complex and dispersed interrelationships around them. It is from these expanded understandings of site that this research approaches the situation of the North Sea in the context of the Anthropocene. In this context the North Sea cannot be understood as a purely topographic site, but is a complex place of interrelations positioned between human and nonhuman actants. This research asks how the participation in discursive situations can be diversified to represent the materiality of nonhuman actants that compose sites and engage with the extended time frames of the Anthropocene.

0.2 The Agency of Things

An understanding of how materials can be entangled with social and cultural spaces is offered through Jane Bennett's idea of *Vibrant Materialism*. She proposes a 'thing power' that seeks to highlight 'the active role of nonhuman materials in public life' (Bennett, 2010, p.2). It is a position that suggests that matter is not inert, it does not remain in a constant state and does not always conform to the roles that humans prescribe to it. Bennett writes that the *power of*

things ‘draws attention to an efficacy of objects in excess of human meanings, designs, or purposes they express or serve’ (ibid p.20).

Bennett opens her account of this *power of things* with a description of a rubber work glove, a mat of pollen, a dead rat, a bottle cap and a stick that she encountered in a gutter on a sunny morning. She describes how they ‘shimmied’ between ‘debris and thing’ (ibid p.4), between a record of human activity and ‘stuff in it its own right’, exhibiting that excess beyond human meanings. This collective of objects, the ‘contingent tableau’ that they formed was ‘not entirely reducible to the contexts in which (human) subjects set them’ and allowed these objects to appear as things (ibid p.5). The *glove-pollen-rat-cap-stick* ‘issued a call’ to Bennett on that Tuesday morning, that objects are not inert or mute matter, things are not fixed or stable but have a vibrant materiality; a capacity to make things happen (to have effects) that is more usually reserved for cognisant, human subjects.

This sense that things cannot be reduced purely to objects or indeed to the actions of subjects, that things cut across such binary divisions, is an idea that has been in part developed from the writing of Bruno Latour. Whether it was the hole in the ozone layer and AIDs (1993) or critical levels of atmospheric CO_2 and the Anthropocene (2014, 2017), Latour has argued that these phenomena cannot be understood as exclusively social, or exclusively natural, but are ‘*imbroglios* of science, politics, economy, law, religion, technology, fiction’ (Latour, 1993, p.2). Nature and society, humans and nonhumans, science and politics are caught up in the same story and as such cannot be separated out and need to be understood as hybrids.

The Anthropocene is, for Latour, a situation that demands new dialogues between science and politics in order to inform new understandings of human relations to the planet. When Latour asks whether we are equipped to deal with the news that atmospheric carbon dioxide has reached a concentration 399.29 parts per million, he points out not just the diversity of scientific disciplines involved in producing the figures but also the ‘historical drama in which those sciences are… so deeply entangled’ (Latour, 2014, p.2). It is no longer possible to look to ‘an objective fact’ as coming from a place of ‘natural science’ because ‘the very notion of objectivity

has been totally subverted by the presence of humans in the phenomena to be described—and in the politics of tackling them' (ibid p.2). Nature, science and politics can no longer be understood as matters-of-fact made up of undisputable objects but need to be understood as matters-of-concern, made up of hybrids.

In *We Have Never Been Modern* (1993), Latour traces the history of how the separated accounts of nature and society came to be constructed in the 17th century. He narrates how political philosopher Thomas Hobbes and natural philosopher Robert Boyle shaped the independent fields of science and politics, where the nature of phenomenon could be observed as fact through science and humans were free to determine society without recourse to anything else. Both were rational positions that 'cross-out' the need for God but each also excluded the other. This is what Latour calls the 'Modern Constitution', a 'double creation of a social context and nature that escapes that very context' (Latour, 1993, p.15). It is a paradoxical situation that divides humans and nonhumans and excludes the proliferation of hybrids, one that he argues makes both physical and social sciences 'see double' (ibid p.53) by trying to reconcile the two positions.

It is by bringing *things* back into the space of discourse, by making them public, that Latour suggests 'A *Parliament of Things'* can be constituted, 'a democracy extended to things themselves' (ibid, p.142). A new constitution where hybrids are represented and recognised, rather than being denied in favour of the clear-cut dualism of nature and society.

In the catalogue to the exhibition *Making Things Public* (2005)[3], Latour traces the etymology of the word *thing* to its roots in German meaning an 'archaic assembly'(2005, p.22) [4] and uses Heidegger's interpretation of a thing as a gathering (ibid p26), to describe how things are a part of that assembly, not designated as objects 'thrown out of the political sphere, standing there objectively and independently' (ibid p.26) but sharing political space with people. This is an

[3] The exhibition *Making Things Public* was curated by Bruno Latour and Peter Weibel, at ZKM, Germany 2005 and addresses how *things* intersect with social and political spaces.

[4] In the same catalogue Barbara Dölemeyer (2005 pp.260-267) describes that in Old High German 'Ding, Thing and Thin…comprised …meanings of general assembly' (ibid p.260). These *Things (meetings)* would take place at standing stones, meadows or large trees where people could meet. As such The Thing infers both the gathering of the people and the places where they gathered.

idea that recognises that ‘things are more social, more collective than nature and that society is more real, nonhuman and objective than it is a disembodied projection’ (Latour, 1993, p.55). Latour’s *Parliament of Things* offers a way to acknowledge humans and nonhumans together, where ‘Natures are present but with their representatives, the scientists…Societies are present but with the objects that have been serving as their ballast’ (ibid, p.144). In this way the mediation, networks and collectives can be made present, rather than being hidden below the dual constructions of separate nature and separate society.

When Latour talks about the hole in the ozone layer his parliament defines a common space where the different representatives, whether they are a climatologist, a chemical industry representative or a voter, are able to talk about the same thing; the hybrid ‘object-discourse-nature-society, whose new properties astound us all and whose network extends from my refrigerator to the Antarctic by way of chemistry, law, the State, the economy, and satellites’ (Latour, 1993, p.144).

Latour’s hybridity and assembly of things informs the configuration of Bennett’s assemblages and although the effects of the *glove-pollen-rat-cap-stick* is less well defined than those of Latours examples of ozone depletion or global warming, its effects are similarly networked between multiple human and nonhuman actors, between natural and social, and can be addressed through both science or politics. This recognition that things are neither exclusively social or material, presents opportunities to consider how nonhumans contribute to the formation of an expanded idea of site and how they can inform the context of Doggerland in this research.

0.3 Distribution of agency

A distinctive feature of Bennett’s account of the efficacy of things, beyond moving the capacity to act away from something that arises exclusively from human effort, is that she argues that things do not act alone. There is a confederacy (Bennett, 2010, p.21, p.37) between things that gives them agency. Bennett emphasises how effects do not arise from a single actant working on its own but how actants are dependent on ‘collaboration, cooperation and interactive interference from

other bodies and forces' (Bennett, 2010, p21). In this way agency begins to become 'distributed across an ontologically heterogeneous field' (ibid p23). The capacity to act becomes delocalised, any correlation between cause and effects is distributed among multiple human and nonhuman actants within a field of effects, in Bennett's terms, an assemblage.

The assemblage has an agency in-its-own-right, but one that emerges from the effects of each member-actant within it. Critically, each actant maintains its own distinctiveness, its own 'energetic pulse' that is 'slightly off' from that of the assemblage which means it can never be fully reduced to a sum of its parts. Bennett describes assemblages as having uneven topographies, where various 'affects and bodies cross paths' creating uneven distributions of power across its surface. Through these interactions of the member-actants, that support or confound each other and create both tensions and synergies, an assemblage remains an 'open-ended collective' whose properties are always emergent and 'distinct from the sum of the vital force of each materiality considered alone' (ibid, p24). As such the effects of an assemblage do not arise from some form of central control or unified body with a singular purpose. There is 'no one materiality or type of material [which] has sufficient competence to determine consistently the trajectory or impact of the group' (ibid, p.24). It is from within the diverse mix of vibrant materials and the interactions between them that the efficacy of an assemblage is produced, distributing agency across the multiple actants that compose it.

An assemblage has a 'distinctive history of formation' and 'a finite lifespan'; an assemblage is only temporarily stabilised before the energies within it reconfigure and reshape it (ibid, p.24). The mix of things at work within the assemblage is constantly being pulled and adjusted as the effects of the individual member-actants wax and wane or they enter and leave the assemblage. This produces an assemblage that is not a fixed or stable entity but one that focuses on the contingencies and histories of its formation, its emergence and becoming. This ongoing process strongly resembles that of *deterritorialisation* and *reterritorialisation* in Deleuze and Guattari's description

of assemblage (1987, p.9) , an idea which Bennett draws from (Bennett, 2010, p.23).

For Deleuze and Guattari an assemblage forms a territory from the *milieu* (Deleuze & Guattari, 1987, p.585), from the intermediary spaces of the interactions between multiple human and nonhuman actants. As with Bennett's description of an assemblage, it is only momentarily stabilised before becoming unbalanced and collapsing along 'lines of flight'. Lines through which multiplicities 'change in nature' and 'connect with other multiplicities' (ibid, p.8) moving the assemblage away from any sense of a stable unity. This deterritorialisation is simultaneously being reconfigured by a connected and parallel process of reterritorialisation; the push and pull of affects, desires and *things* reforming and moving the assemblage towards a 'plane of consistency' (ibid, p8). Deleuze and Guattari introduce this continual process through an example of orchids that emulate wasps in order to be pollinated by them (ibid, p9). They argue that the orchid deterritorialises itself by forming an image of the wasp, the wasp in turn reterritorializes itself on that image. Simultaneously the wasp is deterritorialised as it becomes a part of the reproductive cycle of the orchid while reterritorializing the orchid as it transports its pollen. The wasp and orchid form a *multiplicity* through their interlinking. It is more than mimicry or representation of the wasp by the orchid, there is a 'circulation of intensities' that emphasises 'the becoming-orchid of the wasp' and 'the becoming-wasp of the orchid' (ibid, p.9). There are continual relays of de- and re- territorialisation of both wasp and orchid, that perpetuate more deterritorialisation and further connections to more multiplicities.

Considering the wasp and the orchid, or examples from the North Sea, like scallops cultivating sponges on their shells, or corals growing on the legs of oil-rigs, specific organisms are deterritorailised, and it becomes, as Morton (2010, pp.33-35) and Haraway (2016, p.58) suggest, less clear where one thing ends and the other begins. Things cannot be seen as autonomous and they move towards a sense of multiplicity. In Deleuze and Guattari's terms a multiplicity should not be understood as an adjective, a multiplicity *of* some-things but as 'a substantive form', *a* multiplicity (Roffe, 2005, p.181). In this way a

multiplicity is not quantitative, it is not a repetition of multiple units or multiple fragments of a unified whole but ‘a multiplicity has neither subject nor object, only determinations, magnitudes and dimensions that cannot increase in number without the multiplicity changing in nature’ (Deleuze and Guatarri, 1987, p.7). Through the processes of de- and re- territorialisation, any increase or indeed decrease in magnitude will fundamentally change the multiplicity and it is ‘precisely this increase in dimensions of a multiplicity that changes in nature as it expands its connections’ that for Deleuze and Guattari defines an assemblage. (ibid p.7)

The idea of assemblages suggests that things are less complete in themselves, but become more animated through their interconnections with other things. Their effects become distributed within the assemblage, and can emerge in unexpected ways within the constantly shifting field of relations as the assemblage is constantly reterritorialised. This asks questions of how things are composed at different scales and more specifically in the context of this research asks new questions of how *site* is composed not as a pre-existing bordered location but one that emerges from an assemblage.

Bennett presents the example of an electrical blackout that affected a swathe of the North Eastern United States in 2003, to describe how the effects of human and nonhuman things can become delocalised and distributed through an assemblage. On that particular day in August, over 50 million people lost their electricity supply over an area of twenty-four-thousand square kilometres. Examining the possible causes of the blackout, Bennett argues that a single cause cannot be easily identified and that the blackout is better characterised as an effect that emerged from the electrical grid, which she suggests should not be understood as an organized system, like a machine formed of parts, but is better understood as:

> a volatile mix of coal, sweat, electromagnetic fields, computer programs, electron streams, profit motives, heat, lifestyles, nuclear fuel, plastic, fantasies of mastery, static, legislation, water, economic theory, wire, and wood—to name just some of the actants.
>
> (Bennett 2010 p. 25)

Within this assemblage is a loaded mixture of lively materials, exerting effects that both reinforce and interfere with each other in equal measures. As I have described, Bennett argues that the properties of assemblages are emergent and not entirely predictable, as such she suggests that the origin of the power failure could not be attributed to a singular causal agent on that day, but arose from a 'dissonance' amongst the assemblage of human and nonhuman actants. To fully identify the causes of an event like the blackout, or any other complex system, like changes in climate for example, would require an account of the infinite number of actants across multiple scales and locations and the infinite interactions and relationships between each of them. Any such effort would, like the blackout, soon collapse in a cascade of overload and feedback. Understanding the phenomena of the blackout as an effect of the assemblage of the power grid allows it to be understood as a multiplicity of things. Each thing asserted its force, which collectively for the duration of the blackout had a surprising and unforeseen effect that did not align with human intentions. Agency, the causal intention behind the effect of the blackout, became in this way distributed.

To acknowledge that there was not one cause, is to also acknowledge that there is more than one point of origin for the effect of the blackout. So not only were the effects of the blackout distributed over a large geographic area but so were the causes, and these have the potential to reach even further. For example, the 'loop flows' of electricity identified by the representatives of FirstEnergy ran right around The Great Lakes and the legislation that privatised and fragmented the management of the electricity grid was signed off in offices in Washington and agreed across the USA. To identify *the* site of the blackout becomes more difficult, as it quickly expands and becomes complicated, moving outwards through the vibratory effects of the humans and nonhumans within the assemblage. To ask the question, where the blackout took place presents many different answers; was it in the homes of the people affected, the power stations that shutdown, or where the transmission lines clipped some tree tops in Ohio? It may have been in the stomach of the power station worker who did not switch on a monitoring system when he went out to lunch! As the agency behind the blackout becomes distributed so too is any

sense of locality, as a multiplicity of sites are implicated in those effects. Bennett's argument suggests multiple 'agential loci' (ibid, p.26), from the miniscule scale of an electron, to the location of a wild fire that burnt a power line, through to the offices of power companies and stock market trading floors, each offering a different site at which the blackout becomes present. By teasing out these connections between particular sites, agency can be seen to be moving out and away from the spatial limits of site as a location. This implies an idea of site that can no longer be viewed as entirely local, or simply as spatial containers. They are revealed to be active topographies, a part of the assemblage; shaping, influencing, participating and interacting with the *things* which Bennett suggests have effects and agency.

0.4 The contemporary North Sea

How then can the North Sea be approached in the context of this research as an assemblage, as a complex site composed through the interrelations of human and nonhuman things? Anthropologist John Mack writes that until recently, from a western European perspective, the sea has been perceived as 'not somewhere with history' (2011, p.16) and has been thought of in terms of space and not place, portrayed either as a 'backdrop' for the action which takes place on land or simply as a 'means of connection' between significant points on land; as such it has come to be seen as a space to be traversed, a 'void' between land. As Mack reminds the reader, the name Mediterranean implies the sea is 'simply the space in between these lands' (Mack, 2011, p.19).

This is a perspective reflected by the International Hydrographic Organisation's (IHO) document *Limits of Oceans and Seas* (1953) which still defines the boundaries of the world's seas and oceans. This document delineates The North Sea in just 549 words (IHO, 1953, p.6) and a set of 23 geographic points *on land* (see figure.1). It is a representation that treats the sea as a uniform space that is ancillary to the land, with no consideration for its own materiality or regard for its changing conditions, the flow and currents of the water or the people and animals that populate or move through it. The sea is then further delineated into defined zones that extend terrestrial borders across the sea. Radiating out from the land,

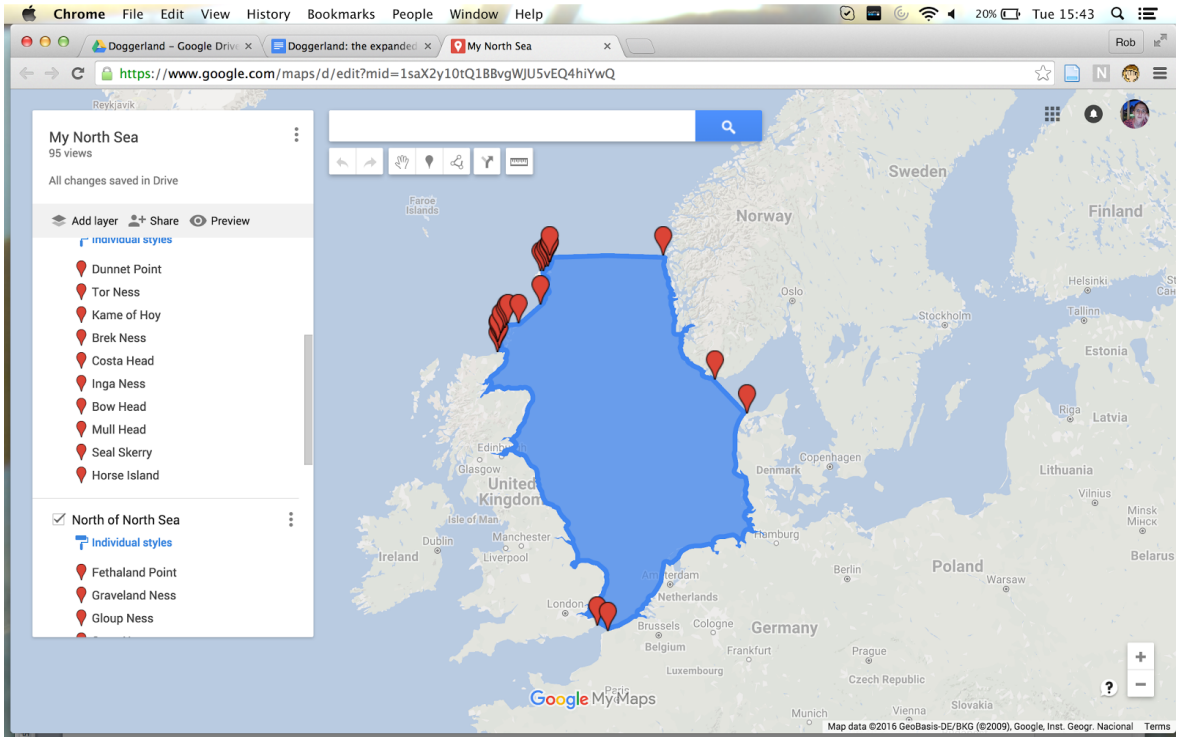


Figure 0.1 Map of the North Sea drawn from the International Hydrographic Organisation's document *The Limits of The Ocean and Seas* (1953). Drawn by the author using Google MyMaps. Available at: https://www.google.com/maps/d/edit?mid=1saX2y10tQ1BBvgWJU5vEQ4hiYwQ (Accessed: 10 January 2019)

territorial waters can be claimed by coastal states up to 12 nautical miles out to sea, a territorial claim that then extends further out to an exclusive economic zone that can reach 200 nautical miles from the shore[5]. This division of the sea is a political and legal construction, an 'idealisation' of the sea which Steinberg (2001) argues has developed through a desire to facilitate free and frictionless movement of goods and the global flow of capital around the world, a process through which the sea is necessarily flattened so that 'ships reign supreme across… [its]…static empty surface' (Steinberg, 2018, p.220).

Lewis Carroll's map from the *Hunting of the Snark* (1876 cited in Anderson & Peters, 2014, p.3), a sea chart that depicts nothing but '- a perfect and absolute blank!' provides an analogy for this flattened space of the sea (Anderson & Peters 2014 p.3, Lee, 2015, 3:53-4:26). An undifferentiated representation that has been symptomatic of Geography's focus on the socio-cultural and geo-political; the human occupation of the land, where the seas and oceans are peripheral to it. Anderson and Peters (2015 p.5) seek to 'recentre' the ocean as a place rather than a void or quantitative space calling for a 'fluid ontology' (ibid p.10). An approach to thinking of the sea as a 'more-than-representational space', one in which human and nonhuman actants and materialities can 'merge in this processual fluid medium' (ibid p.9).

I seek to situate this research within this material and fluid medium of the North Sea, and to recognise it as a place that emerges from its 'instability' (Anderson 2014a p.73) rather than being defined by fixed and stable relations to the land as cartographic representations would suggest. Geographer Jon Anderson develops new understandings of the sea through the embodied presence of being in the sea in either in kayak (Anderson, 2014b, pp.103-118) or on a surf board (Anderson 2014a, pp.73-83). By being within 'the flow' of the wave Anderson suggests that a surfer experiences a place that temporarily converges around their presence in the water, in an 'actor centred geographic becoming' (ibid p82). There is a complex interaction of the mind and body of the surfer with the mobility and materiality of

[5] The North Sea is subdivided into seven Exclusive Economic Zones, bisected by a median line that divides the claim of European coastal states on the East and the UK on the West.

the wave, which temporarily converge to form an assemblage, not a place that is fixed or stable but one that emerges within their relations, a place of becoming with the sea.

Steinberg & Peters similarly propose an idea of a ‘wet ontology’ to move the sea away from being a flattened and dematerialized space of socio-political construction as presented on maps, towards understanding the ocean as a material assemblage. They draw attention to the depth, volume, liquidity and the continual ‘churning’ motion of the ocean (Steinberg & Peters, 2015, p257-259). Through examples of the Deepwater Horizon oil spill (ibid, p.253) and the missing Malaysia airline flight MH370 (ibid, p.254), and arctic sea ice (ibid, p.260), they describe how the sea’s materiality crosses lines of division, complicating and frustrating human attempts to represent it. Like Anderson, they argue it is through emphasising the sea’s materiality, its continual mobility and state of ‘becoming’ that a distinct understanding of oceanic space emerges, that moves towards a framing of the ocean as an emergent assemblage, one that is not just formed in the three-dimensional space of sea but is continually being formed in time too.

Steinberg (2018) argues that the contemporary space of the sea is becoming an increasingly crowded place, as that *blank* cartographic space of the sea is filled with the fixed infrastructure of oil rigs, wind turbines, tidal generators and is now seen as a new frontier for mining and exploration (Steinberg, 2018, p.219). This movement of predominantly onshore industries to offshore sites, highlights the importance of understanding the sea as distinct from the land and not just an extension it. It poses questions of how these activities should account for the mobility of the sea and recognise its complexities and uncertainties as a place. It calls for improved understandings and improved governance of the often ‘unanticipatable’ interrelations of human activities and the marine environment (ibid p.224) at a time of increased awareness of human impact on the planet.

0.5 Anthropocene Context

In 1998 Michael Mann published what has become known as the ‘hockey stick graph’, that showed an anomalous rapid acceleration of average global temperatures in the late twentieth century (Mann et al, 1998, p.783). Since then

there has been an increased awareness of the effects of human actions on the planet and it has become generally recognised that these increases in temperature are anthropogenic in their causes. The International Panel on Climate Change (IPCC) states 'Human influence on the climate system is clear and recent anthropogenic emissions of greenhouse gases are the highest in history' (IPCC, 2014, p.2). The IPCC also state that 'global mean sea level [will continue] to rise' (ibid p.4) and it is 'very likely'(ibid, p.13) that it will be at faster rate than previously observed. Estimates of by how much sea levels will rise vary in different scenarios but the IPCC estimates sit within a range of 0.26 and 0.85 metres (ibid, pp.11-13).

Discussion in the media seems to be more uncertain about how quickly and by how much sea levels will rise. Articles cite an array of different measures and time scales and estimates are continually adjusted as new evidence is uncovered. In the summer of 2018 it was reported in The Guardian that the West Antarctic ice sheet could contribute 25cm to global sea level rise by 2070 (Taylor, 2018), whereas the BBC reported that Antarctic glaciers have lost three trillion tonnes of ice in the last 25 years, suggesting that sea level could rise by 50-60cm by the end of the century (Amos and Gill, 2018), and National Geographic reported a new discovery that glaciers in East Antarctica are now melting, which could on their own raise sea levels by 16 feet if they fully melted (Borunda, 2018). Each report offers a different possible scenario, but what is certain is that these changing sea levels will have profound impacts for human populations and ecosystems in coastal regions and low-lying areas across the world.

In the North Sea, sea-levels are rising annually by 3mm per year (POST, Wentworth, 2010), an increase that contributes to England having 'some of the fastest retreating coastlines in Europe' (Poulton, 2004, p.26). Well documented cases of villages like Happisburgh in Norfolk and Holderness in Yorkshire[6], where houses and roads are sliding from the cliffs into the sea, suggest that the relationship between the North Sea and the land cannot be seen

[6] David Matless (2018) discusses coastal erosion in the Anthropocene using Happisburgh as an example https://www.britishartstudies.ac.uk/issues/issue-index/issue-10/landscape-anthroposcene and Holderness is used as a case study of the effects of coastal erosion in GCSE geography. https://www.bbc.com/bitesize/guides/z2234j6/revision/4

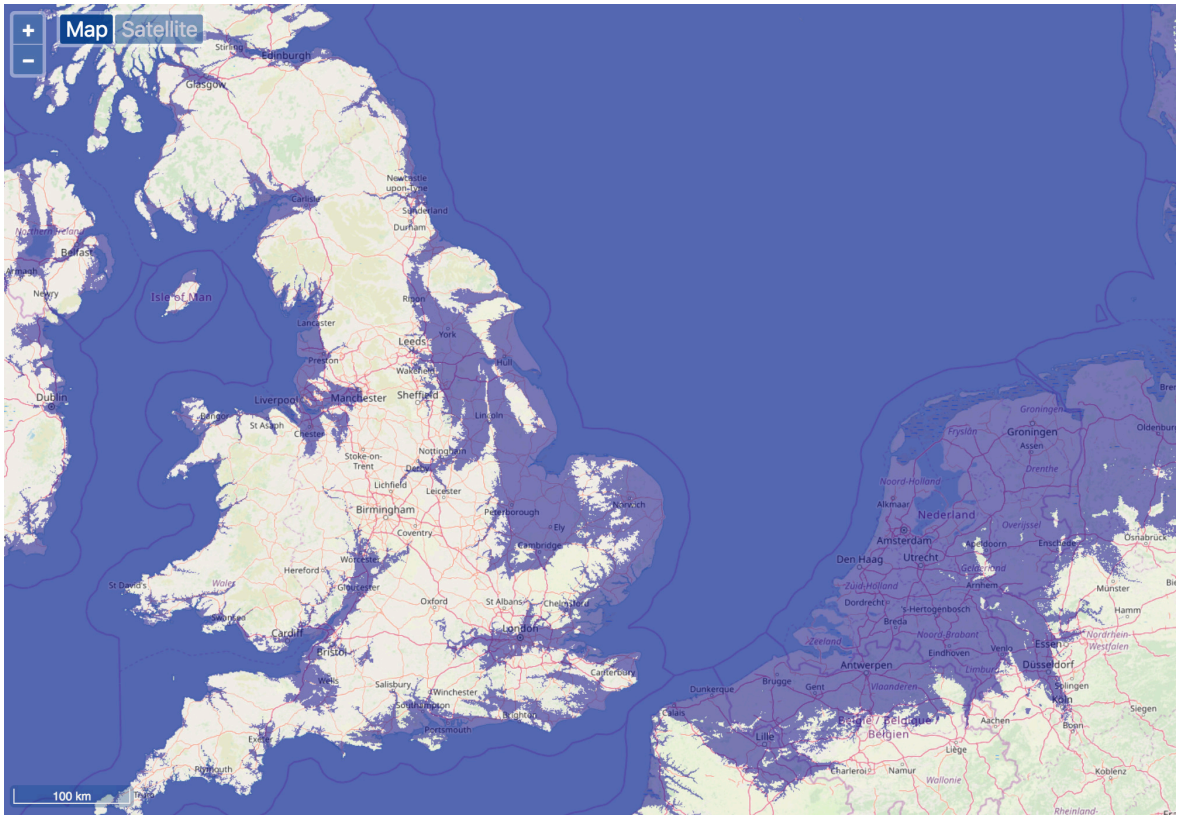


Figure 0.2 Map of the United Kingdom show the possible effects of uncontrolled sea level rises. Screenshot captured by the author from:
http://flood.firetree.net/?ll=53.3297,2.8604&zoom=6.5222097796698435&m=50 (accessed 28 November 2018)

as stable or fixed. With sea levels continuing to rise, these changes will inevitably affect the East Coast of Britain, and could have significant impact on many more areas of the United Kingdom if rises were to continue to rise in an uncontrolled manner (see figure 2).

The anthropogenic nature of climate change increases awareness of how human actions are entangled within these changes in sea level; not only are human histories and societies affected by these changes, these changes are as the IPCC suggests caused by people. It has become apparent, as the IPCC evidences, that these changes in the sea level are driven by effects of anthropogenic climate change. These changes are mainly caused by the burning of fossil fuels that have dramatically increased levels of greenhouse gases leading to rising global temperatures, but the scale and impact of human activities on the planet in many other ways are of such magnitude that Paul Crutzen and Eugene Stoemer (2000) argue that the human species has become a predominant geomorphic force on the planet, and as such can characterise a new geological epoch, the Anthropocene (Crutzen & Stoemer, 2000, pp.17-18).

Since the proposal of this new epoch, The Anthropocene Working Group have been working to formalise it as an epoch that is distinct from the Holocene and in 2016 they reached the preliminary conclusion that ‘the Anthropocene represents a distinct change of geological processes that are clearly reflected in stratal characteristics’ (Zalasiewicz et al, 2017, p.59). Geological research has focused on looking for ‘a golden spike’, a distinct stratigraphic marker that can clearly delineate the beginning of this epoch in the strata. Waters et al (2016) highlight a range of possible ‘anthropogenic stratigraphic signals’ (p.138), from the increase in carbon pollution since the industrial revolution, to changes in levels of nitrates and phosphates in soils from industrial farming or the appearance of plastics and techno-fossils in the strata, through to the radioactive fallout from the detonation of the first nuclear bomb in 1945.

There is a need for clear geological markers to understand the Anthropocene as readable in the geological record of the planet, but this process of delineation risks the Anthropocene becoming seen as a project of measurement and control, one

that is exclusively human. Donna Harraway (2015), who contests the naming of the Anthropocene, suggests that people are just one of many ‘terraformers’ amongst plants and bacteria and that ‘No species, not even our own arrogant one …acts alone’ (Harraway, 2015, p 159). Instead she asserts that the phenomena of what might be called the Anthropocene is better understood through the interactions within ‘assemblages of organic and abiotic actors’. This emphasis asks how human actions are enmeshed with the world rather than measuring human effects on it, and is one that perhaps better reflects the motivations of Crutzen and Stoermer’s initial provocation of the Anthropocene ‘to guide mankind towards global, sustainable, environmental management’ (Crutzen and Stoermer, 2000, p.18).

Atmospheric carbon dioxide now exceeds 400 ppm, a level that has not been seen on earth for 2.5 million years. Faced with this statistic, Bruno Latour questions if people are equipped to understand it and deal with the vast scale of these events and our role within them as we pass this critical tipping point. He asks; ‘How can we simultaneously be part of such a long history, have such an important influence, and yet be so late in realising what has happened and so utterly impotent in our attempts to fix it?’ (Latour, 2014, p.1) This highlights the problematic context of the Anthropocene; more than being just a marker of geological time, it is a realisation that humans are thoroughly entangled in both the causes of these potentially catastrophic changes to the planet and the solutions to them. It is a situation that as Latour goes on to suggest means that people can no longer rely on the ‘natural order’ of a well composed universe but need to turn their eyes down to the earth and the ‘*kakosmos’* of the entangled actants that we share our situation with (ibid, p.4).

It is in the context of recent discussions of the Anthropocene (Latour, 2014, 2017, Haraway 2015, 2016, Morton, 2010) that this research approaches the North Sea as an assemblage; a situation shared by human and nonhuman actants, interconnected at multiple scales and multiple times. This is a place of interrelations in which we can find equatorial forests populated by dinosaurs feeding oil rigs and contemporary economics, and where the displacement of

people by the rising level of the North Sea 8000 years ago is overlaid by contemporary climate change and decisions of whether to drive to work or not.

0.6 Doggerland

Doggerland calls into question the contemporary configuration of the North Sea. It overlays two opposing conditions of space- land and water- onto the same geographic location, a proposition that implies that it cannot be taken as a self-evident place but one that needs account for its animated processes of change.

The area of land that used to stretch between today's coasts of Britain and Europe was named Doggerland by Bryony Coles (1998) to give it an identity and characterise it as more than just a 'land bridge', emphasising its significance as an archaeological site and as a place of human habitation, a 'land that people knew' and 'a place to be' (Coles, 1998, p.45). It is an emphasis that moves the narrative of the transition between land to water away from being exclusively about geophysical change to highlight the importance of it as an archaeological site, a place of human histories that is socially and culturally important. Looking at Doggerland though from the perspective of the Anthropocene and in the context of this thesis, it is a site that brings human histories and geomorphic change into proximity with each other, and questions how the interrelationships between the changing conditions of the North Sea and contemporary cultures are understood. In the context of current rising sea levels it may be that as Gaffney et al suggest 'the fate of the Holocene[7] landscapes and peoples of the North Sea may yet be interpreted, not as an academic curiosity, but a significant warning for our future' (Gaffney et al, 2009, p.165).

Archaeological finds have been brought up from the seabed since the 17th Century; isolated finds of Mammoth tusks, human bones and flints. These were originally accounted for as anomalies and fitted within existing frameworks of knowledge. It was not until the twentieth century that Clement Reid's book *Submerged Forests* (1913) proposed an alternative to the fixity of the land and sea and offered the first speculative map of how the North Sea might have been in the

[7] The Holocene is the current accepted geological epoch that started in approximately 11,650 BP

past (Gaffney et al, 2009, pp.2-8). As well as his map, Reid, with his wife Eleanor, studied peat samples from the sea floor and began to make suggestions of the climatic conditions of this hitherto unknown landscape based on its flora and fauna. Gaffney et al suggest it was a comprehension of this landscape which at the time exceeded that of the contemporary fields of geology, archaeology and biology (ibid, 2009, p.11). Through a careful accumulation of evidence Reid constructed a view of the world as radically different to how it appeared, and without the archaeological tool of radiocarbon dating to confirm its chronology or even the understandings from plate tectonics that the world is capable of movement and change, it seems an almost inconceivable act of re-imagining the North Sea as land.

Today Doggerland remains invisible and inaccessible to investigation, covered not only by the sea but by thousands of years of accumulated marine sediment distorted by the push and pull of the sea's movements. It is only through methods of remote sensing and taking core samples from the seabed that knowledge of Doggerland can be extrapolated, interpreted and assembled. Since Reid's initial speculations, considerable efforts have been made to understand the landscape of Doggerland, notably by Coles (1998), Gaffney et al (2009) and currently *Europe's Lost Frontiers project* led by Gaffney (2015-2020); but without being able to access and investigate archaeological sites as with terrestrial sites, their knowledge of Doggerland still requires acts of imagination like Reid's, to put together and interpret the evidence in order to compose it.

Even with an array of different data sets from remote sensing surveys Gaffney et al (2009) highlight some of limitations that they still face. The high-resolution 3D seismic survey that would be ideal is slow and costly, so consequently available data is of coarser resolutions (ibid, p.76). The data they did have was a composite of multiple surveys that do not match up perfectly, making some features difficult to see (ibid, p.80) and taking core samples that can offer valuable ground-truthing for the surveys is difficult in the sea (ibid, p.105), and so only covers a sporadic array of points. Because of these difficult conditions, compounded by lack of resolution, the maps that are drawn from these data are still only interpretations composed from available information. The representations of Doggerland remain

incomplete, not *terra incognita* but still a terrain of uncertainty; one that is composed between the familiar coastlines of contemporary maps. Doggerland provides a conceptual framework through which I approach the North Sea in this research. By understanding it as more than a singular physical location, but as a site that occupies different territories at different times, Doggerland unsettles the idea of a stable landscape against which human actions and human histories take place and asks how they are interrelated with each other and how such a site can inform approaches to a situated arts practices.

0.7 A Hole in the North Sea

On the evening of 15th April 1969, the North Sea washed across the screens of televisions in Germany. At the centre of the black and white images, was what appeared to be a hole in the surface of the sea, a circular space where there was no water. The broadcast was punctuated by 13 time-coded intertitles from 13:15 to 16:10 that separated sequences of film which showed the appearance of the hole changing as water moved around it and filled it, until in the final shots a man waded into view to remove a Plexiglas cylinder from the water, deconstructing the scene and any illusion of a hole in the sea.

Barry Flanagan's artwork, *Hole in the Sea* (1969) was made for the television broadcast *Land Art* produced in collaboration with Gerry Schum for the first exhibition of his Fernsehgalerie (15 April 1969). This 'television exhibition' featured works by Marinus Boezem, Walter De Maria, Jan Dibbets, Richard Long, Dennis Oppenheim, Robert Smithson, and Michael Heizer alongside Flanagan and was a formative moment in establishing new ways of working beyond the studio in outdoor locations. Although it is often overlooked by histories of Land Art, as Joy Sleeman points out, it was the first instance of an exhibition to be titled '*Land Art'* (Sleeman, 2011, p149).

These works, by these key artists at the inception of *land art* as a methodology for working beyond the gallery are not I would argue insistent on presence in the way that Kwon and Meyer both suggest they were (Meyer, 2000, p.26, Kwon, 2002, p.11) but offer a different starting point to the trajectory of situated practices. These broadcasts were exploring new possibilities for spatial and

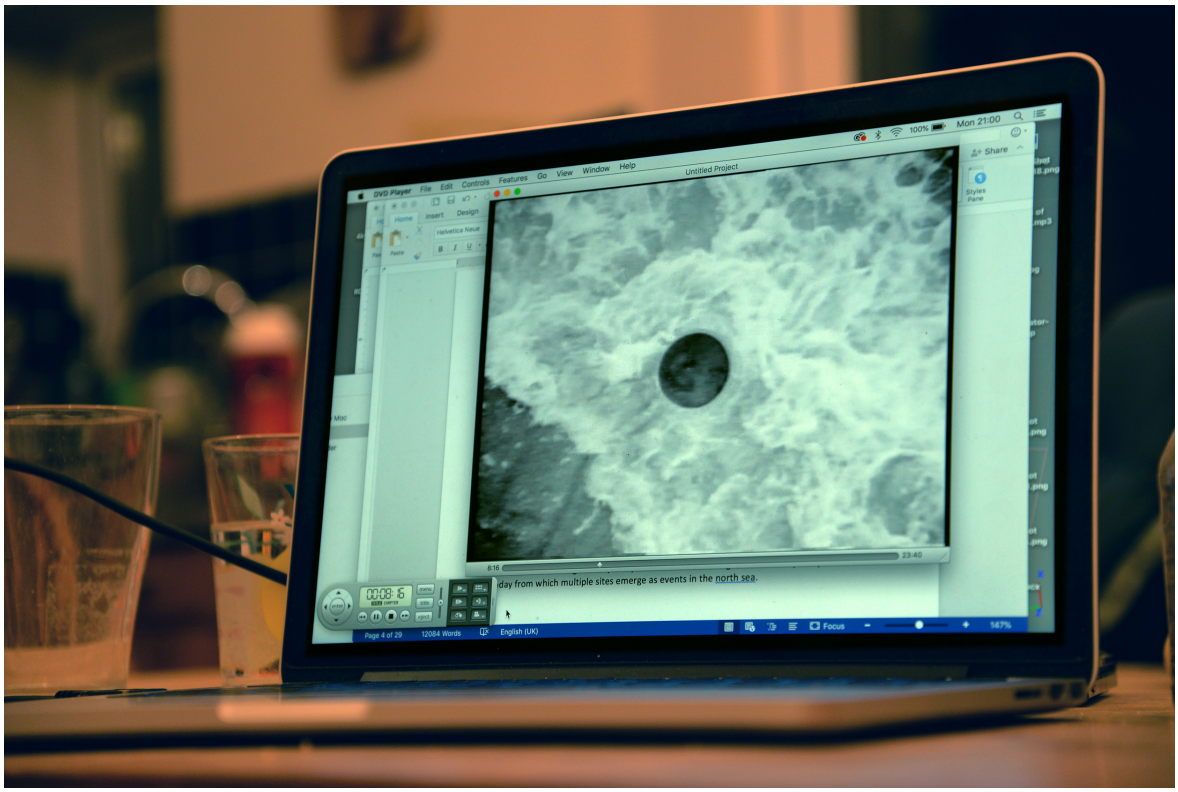


Figure 0.3 Barry Flanagan's Hole in the North Sea (1969) viewed in 2018 on my kitchen table. Photographed by the author 12 December 2018.

temporal relations outside the studio, and ask questions of how technology is an active part of the construction of site for an audience.

Firstly, none of the works left any permanent mark on the landscape, or suggested the monumentality of the earthwork that is the associated with Land Art. Richard Long is simply heard walking across a landscape with camera shots marking one mile intervals on the landscape of Dartmoor. Jan Dibbet's intervention with a digger took place on the beach, so erasure of his geometric marks was part of the work as the North Sea again filled the frame of the screen.

Secondly, they are artworks made for television, to be broadcast into people's homes, not to be located and seen in the landscape. They are not merely outdoor artworks that are documented by television but 'artists using television…to realise artworks which could not actually be conceived at all without television' (Leering, 1969, p70). Schum called them 'Film Objects' clearly marking the moving image as the medium of the work and shifting the emphasis away from the action and the artists' presence in the landscape. The artists that Schum had chosen to work with already had an understanding of the possibilities that television offered as a medium. In 1967 Smithson had imagined the potential to transmit activity from remote sites around the world using television and a work like Dibbet's *Tide Object* 1969 and his other *Perspective Correction* works demonstrate an understanding that the camera is not simply a static frame or a documentary tool but an active agent in the creation of the work.

Thirdly, the works produced for *Land Art* actively explored temporality within the works to create a sense of dislocation within their sites that reflected broadcast television as a time-based medium. Both Dibbets and Flanagan used the incoming tide to add temporal dimensions to their works, emphasising the contingent conditions that form the work. Oppenheim's *Timetrack* (1969) is a line marked by a snowmobile on the temporary surface of a frozen river. As well as being facilitated by the seasonal conditions this work overtly plays with the relations between time and space as the line the snowmobile takes marks the time

zone boundary between the US and Canada, so literally showing two different times at once. Richard Long's ten mile walk in a straight line similarly enfolds multiple time spaces within his film. The timelapse of progress across the landscape as he filmed every mile, is overlaid with a continuous soundtrack of his breathing and footsteps on the terrain marking a continuity of the journey, creating a dissonance in time. De Maria's broadcast for Land Art, *2 lines 3 circles* (1969) sees De Maria walk away from the camera along two parallel lines drawn on to the surface of a desert. The camera turns through three revolutions on a motorised tripod head to see de Maria incrementally recede into the landscape with each turn. This unedited shot, McFadden (2007) suggests, 'encircles the viewer in place' holding them both 'dislocated and located within the structure of the film' (2007, p.51) between the continuous rotation of the camera and the discontinuous 'time-space jumps' of De Maria as he incrementally recedes.

As Flanagan wades into the camera shot at the end of *A Hole in the Sea* to collect the bobbing cylinder that formed 'the hole' from the water we catch a glimpse of the nearby harbour walls and the scene is reconfigured. The illusion of the hole collapses, but at the same time new spaces construct themselves. The idealised space of illusion opens onto the actions of the artist, the plexiglass tube, the harbour wall that afforded Schum the aerial camera shot (with the assistance of fire engine with an extended ladder), the camera (how did he load new film when it was on the end of a ladder?) and in turn the transmission of the broadcast (how much was the film edited between?), the television where you are receiving the broadcast and the many other people simultaneously watching. The site that is constructed is not a singular location but becomes dislocated, filled with time-space-jumps, that like Flanagan's hole points as much to itself as the thing that it is a hole in, the sea. To define a site instantly ramifies into other spatial possibilities, *elsewhere,* to use Smithson's term (Smithson, 1969, p.133).

This dislocation of site is perhaps best identified through the positions drawn up by Smithson of 'Site' and 'Non-Site'. He describes it as a dialectic, a space of dialogue or perhaps suggesting oppositional but generative positions, he defines them in an ambiguous list of characteristics for site and non-site in the notes appending his essay Spiral Jetty: Open Limits / Closed Limits; A series of points /

an array of matter; certainty / uncertainty; scattered information / contained information, are among the list he provides (Smithson, 1972, pp.152-153). Far from clear or definitive, this list is sometimes offered as a means to frame Smithson's concepts of site, and it still holds currency in today's approaches to site based practice. However, a clearer understanding of Smithson's ideas comes from reading on from this dialectic list, to what Smithson describes as a 'range of convergence between site and non-site', one that 'consists of a course of hazards, a double path made up of signs, photographs and maps that belong to both sides of the dialectic at once' (ibid, p.153). This is not a list that defines the parameters of site but a dialectic that actively questions what a site is and how to address it as an artist.

Schum's *Land Art* negotiated this double path, offering multiple sites that were simultaneously located and dislocated. The artworks broadcast that night did not present a simple window into a landscape, a site that represented a binary relation of subject and image; what is revealed is a more complicated site, one that takes the hazardous route between landscape, artist, technology, radio signals, viewer, the viewer's situation, a region of convergence between positions, and one that has as much clarity and possibility as Smithson's dialectic, offering new sites, a different starting point and multiple entangled paths for site oriented arts practices to follow.

0.8 Spiralling Forwards

Robert Smithson's film *Spiral Jetty* (1970) operates in a similar ways to Schum's Land Art broadcasts; it is neither a document of the *Spiral Jetty* or its production, nor an ancillary artwork. It is an artwork that configures new sites from which the Spiral Jetty can emerge and is integral to the multiplication of site that Smithson was evoking.

The final frames of the *Spiral Jetty* do not show the jetty itself or the dinosaur like machinery that made it, but the reel-to-reel editing machine with which the film was made. A photograph of the spiral jetty is displayed on the wall between the two spiral rolls of film. This scene does not point to the film as an intermediary document but as a physical site in the formation of the work. It locates the

physical editing of the film, and it brings the attention of the viewer out of the space of the film as it cuts from the beat of helicopter blades, to an awareness of the whirr and click of the projector behind them and the site of the projection, their situation within the work.

Smithson was aware of the potential for the projection of his work to materialise new sites and multiply the possibilities of the Spiral Jetty. In an interview with Gregoire Müller (1971) he talks of the importance of where and how films (movies) are shown and says he would like the film of *Spiral Jetty* to be shown on the Staten Island Ferry sailing from the middle of the harbour via a spiralling voyage back into port (Smithson, 1971, pp.259-261). Although the film was not shown in this way it presents an idea that new sites can emerge from each showing of the work.

The Spiral Jetty moves away from an indexical link to a single site, the limiting condition of the literal site that Meyer identified, but it is not purely an 'informational' one where the site is 'marked and swiftly abandoned'[8] (Meyer, 2000, p.25). Multiple physical sites of Spiral Jetty appear at different scales, Smithson suggests the roll of film is a 'spiral made up of frames' (Smithson, 1972, p.148) that echoes the form of the jetty that was shot from the spiralling helicopter, as do the salt crystals that cover the rocks of the jetty itself. Each of these scales presents new sites, new points of departure that spiral away on their own path, further expanding and multiplying the possibilities within the work. It is a position that resonates with a description of a spiralling form by Jane Bennett who writes:

> sometimes that-which-repeats-itself also transforms itself. Because each iteration occurs in an absolutely unique context, each turn of the spiral enters into a new and distinctive assemblage-with the absolutely local chips, odours, herbs, thoughts, whirs, images, breezes, light waves, viruses, animals, machines, and minerals in its milieu. Spiral repetitions ... can be accidents that give birth to wondrous and unsettling-enchanting-new forms
>
> (Bennett, 2001, page 40)

[8] When Meyer wrote his text, the Spiral Jetty was submerged, a point he uses to support the idea that the physical site can be abandoned, however the Spiral Jetty has since re-emerged from the Great Salt Lake as a consequence of water shortages in Utah – a combination of over use by agriculture and industry and the effects of climate change.

Bennett's image brings together a mix of human and non-human actants, material and immaterial things from which multiple points of interaction emerge, as opposed to presenting the equilibrium of a fixed and stable relationship. Each rotation of the spiral proposes a new iteration of a site that is filled with differences and brings together new compositions of elements in an assemblage that continues to be re-formed as the rotation repeats.

My explorative practice leading this investigation provides multiple methodologies to explore these spiralling interactions of the churning, mobile actants within the assemblage of the North Sea. By engaging with the multiple different sites through which the material actants of the North Sea become apparent, the artworks produced during this investigation approach Doggerland as a speculative proposition that emerges from the interrelations of human and nonhuman actants in the North Sea.

Doggerland as it emerges in this research is not a submerged terrain waiting to be located and mapped, but presents itself as a distributed site that appears unpredictably across multiple locations and different scales. As with Bennett's 2010 example of the blackout, agency becomes delocalised and distributed through the vibrant materiality of nonhuman and human actors. Moving towards this model of a distributed site offers an expansive approach to situated arts practices that repositions nonhuman material actants within the discursive and informational vectors of Kwon and Meyer in the composition of sites. It is an approach that does not divide between what is human and what is not, and as such it presents a methodology to engage with material and phenomenological sites of the North Sea, and through the distribution of agency, not to become limited by them.

The application of this methodology has allowed multiple sites of Doggerland to emerge within my practice. In the diverse assemblage of the North Sea I have encountered waves, satellites, salt, cameras, boats, oil rigs, fish, the internet, water, cables, servers, studios, data buoys, conferences, exhibition spaces, people, industrial spoil heaps and nodding donkeys. It is from the lively materiality of these *things* that the multiple sites of Doggerland emerge within this research, expanding the spatial limits of how a site is conceived, and like Bennett's image of

the spiralling assemblage, they also suggest an idea of a site that is being continually being recomposed in time.

Following this spiralling double path, my practice led engagement with the distributed site of the North Sea opens a dynamic speculative route, through which my practice addresses the forming of site within the material interrelationships between locations. Through questioning the interactions between local and nonlocal actants from which the multiple sites of Doggerland are composed, my artworks develop new narratives of human interrelationships with the North Sea, and present original approaches to site based practices that emerge from them.

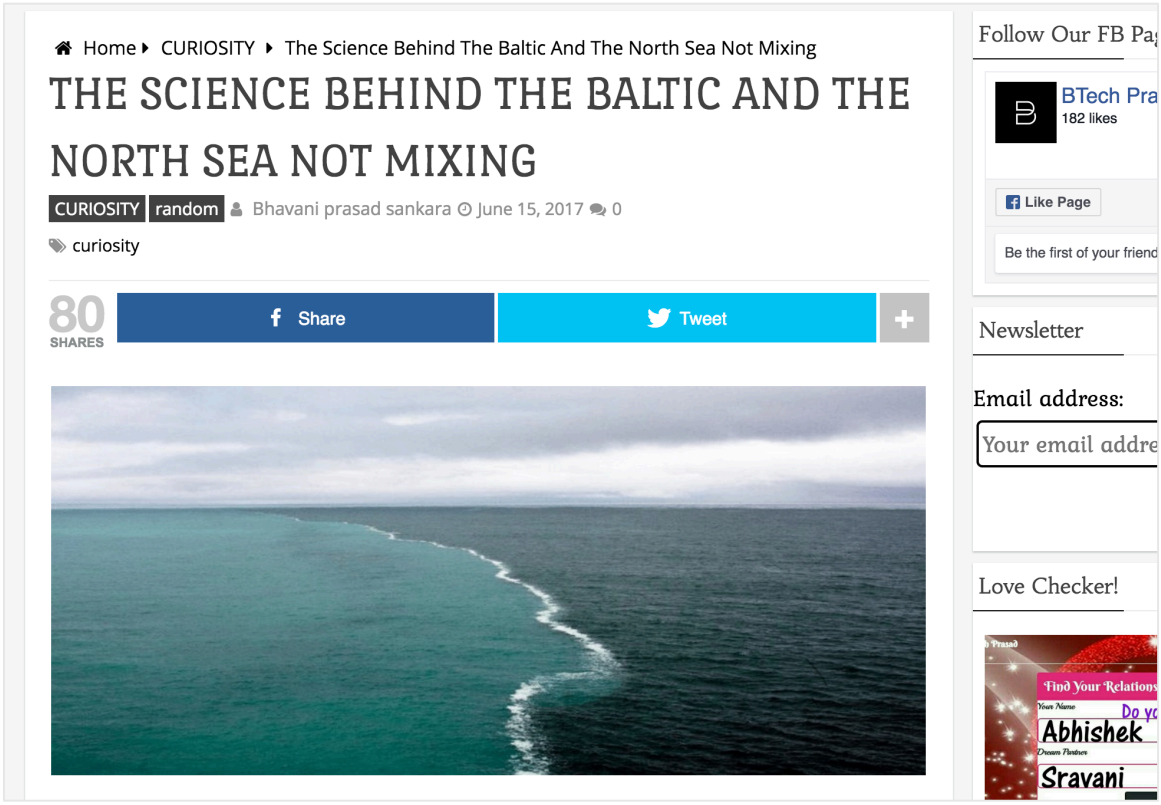


Figure 1.1 The Science between the Baltic and The North Sea not Mixing. Screen shot captured by the author. Available at: https://btechprasad.com/science-behind-baltic-north-sea-not-mixing/ (Accessed 15 Nov 2018)

Figure 1.2 Tania Kovats (2013-14) Where Seas Meet Baltic:North. Photographed at the exhibition *Artists explore the Sea*, Ferens Art Gallery, Hull 11 August 2017

Chapter 1: Situated within the assemblage of the North Sea

Doggerland suggests an understanding of the North Sea that can expand beyond its spatial limits, towards an alternative comprehension of the North Sea that is able to account for its capacity to move and change. Its geographic boundaries are clearly laid out in the World Hydrographic Organization's document, *The Limits of the Oceans and Seas* (1953), outlined in my introduction (pp.38-39), which defines the North Sea as a space in relation to land. This delineation becomes problematic though, where seas meet offshore, and the material conditions of the sea quickly show these borders to be more complicated.

During this enquiry, there has been an image circulating online that claims to show a defined boundary between the North and Baltic Seas, which do not mix because of their different salinity (see figure 1.1). This is not the case[9], but it is an example that highlights the contradictions of creating a border in the sea and suggests that a definition of the North Sea would need to account for both its socio-political construction as well as its fluid materiality.

The problematic meeting of these two seas is similarly addressed by Tania Kovats' work, *Where Seas Meet, North: Baltic* (2013–14) (see figure 1.2). It presents a flask of water from each sea, separated by a short length of tube, and visually indistinguishable from each other. It is an arrangement that suggests an arbitrariness in drawing borders in the sea, across which water moves and mixes freely, and yet each vessel of water is different. Each has its own local distinctions and variations, its own qualities that arise from where it was collected. This is then an artwork that questions the ways in which the sea is represented and draws attention to the complexities of the sea as a continuous body of water that covers 71% of the planet's surface.

This chapter discusses how my practice-led enquiries have addressed the limits of cartographic representations of the North Sea. Through a process of seeking to

[9] The image in fact shows glacial outflow loaded with sediment washing out to sea in Alaska. See original source posted here by Kent Smith https://www.flickr.com/photos/kentsmith9/4955772693/ with an interesting commentary of how it went viral.

locate differences in the representation of the sea - usually presented as a flattened, homogenous space - I offer multiple new images of the North Sea that build more complex understandings of it beyond its spatial construction.
I expand this further through a discussion of the development of my artwork *NorthStudioMoonSea* (2017-18), and identify ways in which sites can extend beyond the physical limits of their location. I describe the construction and the material processes of the work, through which it becomes interconnected with multiple actants and multiple sites, as a part of an animated network of relations in an assemblage.

The chapter concludes by asking how a practice can navigate this relational idea of site, one where, Reza Negarestani suggests (2015, pp.225-246), both local and global contexts are not pre-known but need to be constructed from their interrelationships, from which a ramifying chain of sites can emerge at different scales. It is an understanding of site that moves away from a bounded physical location to a generative position that can inform new constructions of Doggerland, in the context of the contemporary North Sea.

1.0 Abstract Cartography

Robert Smithson describes Lewis Carroll's map from *The Hunting of the Snark,* the *'perfect and absolute blank'* previously presented in the introduction (p.40) as an 'abstract cartography' (Smithson, 1968, p.92). He compares it to a monochromatic painting by Jo Baer (ibid p.93) suggesting that their blank surfaces do not present a 'void' but evoke what he later describes as 'Carl André's motto…a thing is a hole in a thing it is not' (Smithson, 1968a, p.95). This suggests that like the blank surfaces of Carroll's map and Baer's painting, a hole in the flattened profile of an André floor piece is differentiated from that which is around it, and multiplies new forms from it; a double negative, from which new possibilities can emerge.

This complication of flattened surfaces is one also taken up by Rosalind Krauss(1999), who questions the reductive drive of modernism towards a flattening of painting into its support. I suggest that this enquiry can offer a method to understand how new possibilities can be created within the blank, spatial representations of the sea presented by maps. For Krauss the process of painting

becoming coextensive with its support is epitomised in the 'unrelievedly flat' monochromes of Frank Stella, and one that announced to artists like Donald Judd that 'painting had become an object like any other three dimensional thing' (Krauss, 1999, p.10). To counter this flattening condition, she argues for a differentiation within mediums, through the practice of Marcel Broodthaers, and in particular his film, *A Voyage on the North Sea* (1973-74)[10].

Broodthaers' short film presents itself as a book, that announces each of its 'pages' with an intertitle captioned; 'Page 1', 'Page 2', through to 'Page 15'. The film proceeds with each *page* presenting a static image from paintings and photographs of maritime scenes. It begins with a black and white image of a sailing boat, and the first 3 pages incrementally step closer towards it in a broken kind of zoom[11], and just as the viewer is starting to anticipate the next shot, it cuts to another image, a painting of a 19th century ship in full sail that Broodthaers reportedly bought in a curiosity shop (Schultz, 2007, p.206). The zooming action then jerks backwards and forwards between details of brushstrokes and canvas that Krauss says resemble 'abstract painting' and 'radical monochromes' (Krauss 1999 p.52), as well as pictorial elements of dinghy and ship that suggest more narrative forms, before cutting again to a black and white photograph of a 20th century sailing boat offshore from a city.

Broodthaers' film does not present a continuous representation of The North Sea, nor a narrative of a voyage on it, but finds internal differences within it. The structure of this work confounds any easy reading of it and its successive moves between abstraction and representation for Krauss 'scramble the account of a modernist progression'(ibid, p.52). What we are offered in its place is a 'passage between surfaces,' a movement suspended between the 'flatbed' of the modernist canvas and the projected image of the film (ibid, p.52). Krauss argues it is the acknowledgement of the work's incompleteness and lack of self-sufficiency within its layering, that sets it apart from the position of a modernist artwork that is 'utterly coextensive with its own origin.' Broodthaers presents a new 'fiction' of the North

[10]A video of the film can be viewed online at: https://www.youtube.com/watch?v=gg1fkhLxa14
[11] Krauss is critical of the continuity of the zoom in Michael Snows film *Wavelength* (1967), a 'vector' that she suggests attempts to create unity in the 'aggregate' medium of film- a gesture she describes as 'thoroughly modernist' (1999, pp.24-26).

Sea which for Krauss enacts the 'self-differential condition of mediums themselves' (ibid, p.53). This understanding of a medium's self-differing condition, one that finds new fictions and stories within it, suggests an approach that can be extended to the flattened surfaces of cartographic representations of the sea and presents ways in which new understandings of the North Sea can emerge from them.

Through my practice I began to address the monochrome of the sea presented by digital mapping tools like Google and Bing, looking for internal differences within the flat blue representations of the sea that appeared on my computer screen. When researching a site for a project I will often use Google Maps to get an overview of it; to plan how to access or approach it, but with the North Sea these methodologies were not open to me. Satellite imagery that can be used to identify features of terrestrial sites ends at the edge of the land, and photographic images of the sea's surface are quickly blended into a generalised blue bathymetry, that in the shallow water of the North Sea is almost flat. Google Maps can be used to plot the points that define the space of the North Sea as a map, but there is no variation between those markers. Without satellite images, the sea remains abstracted, details of ships and the routes they follow, offshore infrastructure such as turbines and rigs that could act as points of difference on the surface are not represented, and as such the digital mapping tools of Google, Bing and other services contribute to a representation of the sea that is flattened and undifferentiated.

As a counterpoint to this generalisation and using another of Google's products, Google Images, using the search term 'North Sea' produces over 800 000 000 results[12]. A proliferation of images, aggregated from perhaps millions of internet users' experiences of the North Sea: waves; maps; oil platforms; whales and dolphins; a man throwing a greyhound off a pier; beaches; ships; swimmers and more. Both Google's maps and searches present a montage of images – one blended to create an illusion of continuous space and the other an assortment of

[12] Image search carried out 24th November 2018.

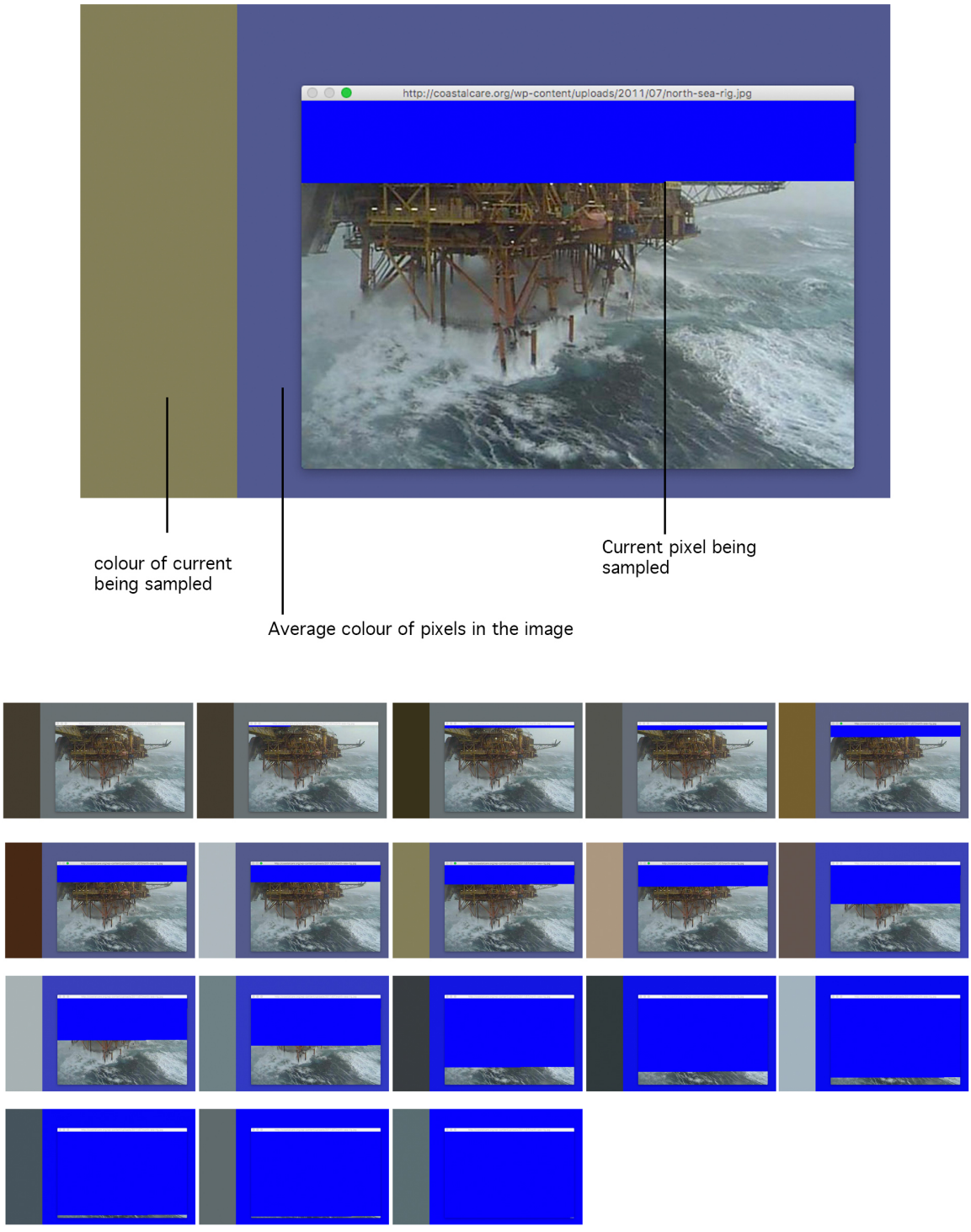


Figure 1.3 Sequence of images to describe process of colour sampling pixels used in *NorthStudioMoonSea* (2017-18)

separate events– both are delivered though through the interface of a screen as an array of pixels, further highlighting the disparity between the maps' uniform display of blue and the billions of colours of the pixels that constitute these other images of the North Sea.

To think about these differences, I developed a computer program using the visual programming language MaxMSP, that would go on to form an element of the work, *NorthMoonStudioSea* (2017-18). The software downloads one of the results from the image search 'North Sea' at random and displays it. The program then systematically works across the individual pixels of the image, from top left to bottom right, displaying the colours of each pixel that are inflated in scale to full-frame images through a projection, while replacing it in the original image with a blue pixel. In this way, the original image is pixel-by-pixel transformed from one representation of 'The North Sea' into a flattened blue surface while offering an alternative set of monochromes of the North Sea in contrast to that of Google Maps (see Figure 1.3).

Examining these images of the North Sea through the pixilation process transformed them from singular representations to sets of data; multiple coloured pixels, collected from multiple sources. The images returned by the Google Search have not been gathered by Google to represent a particular image of the sea but are accumulated from people who use the internet and who have uploaded millions of images to it. Collectively they show the diversity of uses, perceptions, inhabitants and understandings of The North Sea and become suspended between their appearance on a screen, their transmission as data and the images of the North Sea that they represented.

The images downloaded by my software are located on numerous servers around the world, industrial buildings filled with hardware and cooling systems, connected by miles of fibre optic cables that very probably cross the bed of the sea to connect with Google's data centres and return the images of the North Sea back to the computer in the work. The internet is a network of physical locations that can further multiply the interconnections with the images of the North Sea displacing further an idea of a singular site or representation of it.

Figure 1.4 Evan Roth *Redlines* (2018-19). Screen grab showing one of the videos shared through the peer to peer network. Work is available online until September 10, 2019. Available at: http://p2p.redlines.network

Increasingly, arts practices have sought to provide alternatives to the idea of the internet as a disembodied, ephemeral cloud of data, presented by technology companies, and instead to find sites of difference within it. Artangel recently commissioned a project by Evan Roth, *Redlines (*2018)[13], that shares videos of the sites where undersea cables, the actual network of the internet, emerge from the water after crossing the sea. Shared through a peer-to-peer network, the connections of the audience can be mapped and located, extending the geographic edges of where the work begins and ends, shifting outwards through cables, telephone exchanges and server racks of the internet. Similarly, Tim Shaw's work, *Ring Network (*2016)[14] and Olia Lialina's work *Summer (*2013)[15] draw attention to the physical infrastructure of the internet and its global distribution. By working with the time taken for data to be transmitted and making the resulting delays and glitches apparent, these works highlight the globally distributed locations of servers and the discontinuities of the space between them.

1.1 NorthStudioMoonSea

These processes of finding difference and multiplicity within the images of the North Sea were also reflected in the construction of my artwork *NorthStudioMoonSea* (2017-18) (see Part 1, pp.2-5 for documentation) This artwork was not made as a singular object, or rendered from a raw material but in terms of its sculptural qualities could be described as an assemblage, a bricolage of ready-mades; plastic bags, seawater, video projectors, motorised astronomical tripod, laptop, cables, trolley wheels, copper, mirror and computers.
This arrangement of objects did not appear instantaneously and remains unfixed. It had many iterations through which elements were added and removed, adapting and changing as relationships between the elements changed. These processes are emphasised through kinetic aspects of the work; the mirror turns on an

[13] The Redlines peer-to-peer network can be accessed at p2p.redlines.network further information available at https://www.artangel.org.uk/project/red-lines/
[14] A video recording Shaw's work is available here: https://vimeo.com/192619433
[15] Lialina's work displays a gif loop of a woman on a swing, but each frame of the gif is hosted on different server, so the continuity of the animation becomes dependent on the speed of the connections between these multiple locations. The work can be accessed at: http://www.faithholland.com/olia/summer/ or http://www.evan-roth.com/olia/summer/ or http://jamesbridle.com/olia/summer/ (and more locations)

astronomical telescope mount to track the position of the moon, the projection reflects onto different parts of the architecture, the flow of electricity is generated from the bags of seawater that act as simple batteries. The work is not a static form but is shaped by its multiple elements and the relationships between them. In this way, the work begins to propose different meanings of assemblage, those more akin to Bennett's *glove-pollen-rat-cap-stick* highlighted in the introduction (p.31); a confederation of things, that while remaining heterogeneous, enable each other within the construction of the work (Bennett, 2010, pp.4-6). This assemblage *territorialises* a new site of the artwork within the space of the studio where it was presented, through the interactions of the *things* within it. The site of the work temporarily emerges from these interrelations, extending it at different scales through its connections; computer, server, moon, sea water, before the balance shifts and the assemblage is reconfigured to form a new set of relations.

Phillip Steinberg and Kimberly Peters describe how the sea can be understood as a 'hydroelemental assemblage' (2014, p.250), a position they develop from Deleuze and Guattari's conception of the assemblage to highlight the fluid and dynamic characteristics of the sea. Like Deleuze and Guattari they describe the assemblage as undergoing a continually transforming process of deterritorialisation and reterritorialisation (ibid, p.255). This idea frames the sea in a way that can capture its 'churning' mobility (ibid, p255, pp.257-260) and depth as well as all the human and nonhuman elements- social, political and material- that are active within it. It is an approach that emphasises the ways in which things are connected rather than their form. To understand the North Sea as an assemblage then, is not to understand it as a single fixed place delineated by boundaries but as a place that is continually emerging from its interrelationships.

Approaching *NorthStudioMoonSea* as an assemblage, highlights continual change and contingent processes within it rather than its static form. Instead the form of the work is not entirely predictable and emerges from what Bennett describes as the assemblage's 'uneven topography' (Bennett, 2010, p.24), from the flow and movement of effects as they move across gradients of difference, continually reterritorialising the relationships within the work and with the space of the studio in which it was made and shown. The agency of the separate parts shaping this work, how it emerges in relation to the space and the audience, does not come

from any single point of origin, but can be seen to be distributed throughout the elements of the work.

When considering the *things* that make up *NorthStudioMoonSea,* each has a role to play within the assemblage but no single element is autonomous; each supports another, creating new territories within the work. The bags of sea water within the work for example, are more than just a gesture to make the North Sea literally present. Their presentation is inherently unstable - in plastic bags not rigid containers. Their form is supported as much by gravitational force pressing the water down and outwards, as it is by the membrane of the plastic holding it in. Inside each of the bags is a zinc plated rod and a copper plate, arranged so that when they are connected they form a simple battery producing a small electrical current from the chemical potential of the sea water itself. This potential becomes visually present over the duration of the installation as the water takes on an orange hue from the rusting of rods, salt crystals form in the bags, and verdigris patterns the copper. The changing voltage of the electricity produced is continuously monitored by an Arduino microcontroller and evaluated as a variable in software that controls the speed of the pixilation process described earlier and so in turn, affects the timeframes of the work. These processes offer a way that the sea water is not just physical matter, but is animated within the assemblage of the work, and has agency within the programme running on the computer, affecting the encounter of the audience with the work. In these ways, the materiality of sea water, its ‘energetic pulse’ (Bennett, 2010, p.24) is made present within the work.

Latour (2014, p.14) suggests it is retaining this animation (although he is careful to stress not to artificially inject an over-animation to things) that distinguishes between matter and materiality. Matter he says is produced by following a definition of causality where cause precedes effect. This is an approach that *deanimates* agents by placing action into the antecedent; a causal chain where an agent is *simply caused* by its predecessor (Latour, 2014, p.13). Latour’s definition of materiality reverses this, by suggesting that the effects of actants precede their characterisation as actors that are the cause. Using deliberately diverse examples of General Kutusov from *War and Peace*, The US Army, The Mississippi River and

a chemical produced in the brain called CRF (ibid, pp.7-11)[16], Latour moves towards what he calls the 'metamorphic zone', where he suggests that the shape of Kutusov or the army are no more known to us before their actions than the shape of a river or CRF (ibid, p.12). It is a common 'zone of transactions' (Latour, 2017, p.67) that does not distinguish between human or nonhuman, subject or object and creates a space in which actants can be detected through their effects before they become defined as actors. This proposes an alternative to the deanimating effects of 'a scientific worldview' (that of the binary constructions of *the social* and *the natural*) which Latour argues is inadequate to the task of describing our situation in the Anthropocene, stating that it is a 'crucial political task... to *distribute* agency as far and in as *differentiated* a way as possible - until, that is, we have thoroughly lost any relation between those two concepts of object and subject.' (Latour, 2014, p.15)

This distribution of agency away from static and binary positions can be followed further within the assemblage of *NorthMoonStudioSea* through the work's relationships not only with an expanded site of the North Sea, internet servers, and the moon but with the work's interrelationships with the architecture of the studio where it was presented and how that is reterritorialized within the assemblage of the work. The colours extracted during the pixilation of Google's images of the North Sea are projected onto a circular mirror mounted on an astronomical tripod that has been programmed to track the position of the moon. The effect of this is that the spatial arrangement of the work is continually transformed by the same astronomical body which is simultaneously influencing the territory of the sea through the tides. The circle of projected colour moves slowly across the surfaces in the work following the moon, highlighting elements of the apparatus; its bags, wires, and screens, but equally the reflected light falls onto the walls, brickwork and doorframes of the studio space, bringing them into this assemblage of the North Sea too. The passage of the light also affects the ways in which viewers see the work. Each encounter presents a new set of conditions and a different arrangement of the work and so changes how the audience orient themselves to it, sometimes focusing inwards and sometimes attention is drawn outwards and

[16] Latour revisits these arguements in the chapter *How Not to Deanimate Nature* (2017, pp.50-58)

away.

Drawing attention to the site of the studio allows it to become an animated part of this assemblage, a place situated within the interrelationships of The North Sea and not external to it. The work unfolds over time within the architecture of the studio, presenting multiple different encounters with it; neither the configuration of the work or the space that it is in remain the same.

In these interactions, the work begins to complicate any fixed and binary positions by distributing agency within it. In seeking the internal differentiation that Krauss found in Broodthaers, it moves this artwork away from ideas of singular representations of the North Sea like the flattened space of Google Maps but instead it creates an assemblage that can emerge at different scales within the *distributed site of the North Sea*, that is to say, within the *zone of transactions* with the actants that are the North Sea.

1.2 Zooming Between Scales

If, as I have argued, cartographic representations of the sea are inadequate to describe the churning assemblage of the actants that compose it, then how is it possible to be oriented within these interrelations. Timothy Morton suggests 'We have gained Google Earth but lost the world' (2010, p30), a point through which he highlights the paradoxical situation of what he calls an 'ecological crisis' (ibid p.1); that as technologies make visible the scale of the problems we face, they also reveal that things are less complete in themselves. There is, Morton suggests, no longer a distinction between foreground and background against which human actions can be oriented (ibid p30).

In this section I examine the well-known film, *The Powers of Ten, A Film Dealing With The Relative Size of Things in The Universe and the Effect of Adding Another Zero***,** produced by the Office of Charles and Ray Eames (1977) and its remaking by Andrés Jaque and the Office for Political Innovation (2013-16). I ask how their different approaches to the scale of things, can inform my practice within the disorienting interconnections that the Anthropocene suggests, and how they can offer ways to address Doggerland and the North Sea in a way that reflects these complexities.

The Powers of Ten (Office of Charles and Ray Eames, 1977)[17] begins with a presentation of the everyday, a tableau of a couple having a picnic, surrounded by signifiers of their social status and the techno-scientific (modernist) worldview of the film. From this static scene it uses a single uninterrupted zoom to take the viewer on an epic journey across all the scales of the known universe of the 1970s. The camera moves effortlessly away from the picnic on the lakeside in Chicago, increasing its movement by the power of ten every ten seconds, guided by an unseen narrator, while the audience's viewpoint is anchored by a white square that grows exponentially bigger yet is fixed within the frame of the screen. The film's vertical acceleration away from the picnic soon leaves Chicago and then Illinois behind, to see the Earth as *The Blue Marble*[18], before moving beyond the solar system, out of the Milky Way to the edges of the known universe. Here the square measures 10^{24}metres and the narrator reminds the viewer that '*This emptiness is normal. The richness of our own neighbourhood is the exception*' (ibid, 4:55- 5:00) before hurtling back to the hand of the man at the picnic, through the skin, into his internal cell structure to a nucleus that holds his DNA, and on into the domain of electrons, protons and neutrons that make up everything in the universe, from the atom, to the man, to the picnic, all the way out to the edge of the galaxy.

The device of the film's zoom presents a singular trajectory from the meso-level of the everyday, to a macroscopic view of the cosmos and back into the nano-scale world of the atomic, 'creating the effect of sliding along a giant invisible ruler in space' (Woods, 2014, p.134), a neatly calibrated straight line extending from the right hand of the man having a picnic on the lakeside in Chicago. It is however not exclusively for the central positioning of *Man* as the measure of the Universe that this film has drawn criticism, but for its zooming motion.

[17] A video of the work can be accessed at: http://www.eamesoffice.com/the-work/powers-of-ten/

[18] NASA's image designation AS17-148-22727 is a photograph of the Earth taken by astronauts on the Apollo 17 spacecraft in 1972. Nasa's photographs from space were also a reference for John Latham's film *Erth* (1971) that zoomed from the edge of space to the surface of the Earth and in which 'distance is subsumed within a temporal scale' (Hill 2016 p.89) as a voice over counts down from one thousand million years to one second as it approaches the earth.

Its ‘smooth zoom effect’ (ibid p.134), described as ‘seamless’ by Vittoria Di Palma, smooths over any differences in scale, it ‘shapes our perception in a particular way’ so as to ‘undermine our awareness of the zoom’s artificiality’ (Di Palma, 2009, p.263) and presents a visual illusion of a continuous space. This smoothness creates a lack of what Woods calls ‘scale variance’, assuming that things operate in the same way at different scales (Woods 2014 p.133) and presents an ‘uncanny feeling of symmetry’ where outer and inner spaces are presented as ‘visually consonant with their counterparts’ (Dorrian, 2011).

As a result of this lack of *scale variance,* qualitative differences are replaced by quantitative levels, presenting a view of the cosmos that resides in clearly delineated strata similar to that of a classical conception of ‘Nature’ (Latour, 2017, p106). In the Eames universe, from the smallest atom to the edge of the galaxies, there are no fuzzy edges; levels of scale are stacked inside one another like russian dolls, just changing in size but reproducing the same form at each scale. It is a simplification that permits nothing to change and suggests a world that can be scaled infinitely and seamlessly without differentiation.

An alternative to this smooth zoom is presented in *The Superpowers of Ten* (2013-16), a performance that revisits the original *Powers of Ten* in 3 acts and 9 scenes, created by architect Andrés Jaque and the Office for Political Innovation[19]. It was included in the exhibition *Reset Modernity!* (2016), curated by Bruno Latour and Christophe Leclercq at ZKM in Germany, and through it they presented a critique of the linearity of the original zoom.

The work begins with a meticulous reconstruction of the Eames Studio film, but instead of the film’s zoom being created through special effects and animation techniques, it is created through live performance with papier maché models and painted cut-outs. The effect is far from smooth or seamless. Performers ‘zoom’ by shuffling backwards away from the white square that frames the stage held at the front by another two people. Others run frantically to

[19] A recording of a performance as part of MEXTRÓPOLI architecture festival 2016 is available here (https://vimeo.com/162905806)

continually update the annotations of distance and the power-of-ten that the performance has reached; cut-outs of cars and planes are carried across the stage, giant hands and a paper disc of the solar system appear and disappear, accompanied by a picnic on wheels, a giant sausage and dancing sub-atomic particles.

Through the hand-made props and the presence of the performers, discontinuities and jumps in scale are made apparent. The monologue of the narrator in Act 1 Scene 1 describes how the original *Powers of Ten* viewed 'the interconnection between genes, bodies, societies and technologies' as 'automatic, non-problematical and apolitical' (Jaque, 2016, p.79). It is clear that this work sets out to change that, making the zoom problematic and political by expanding the spaces between the delineated levels of the original.

The performance is further divided into four distinct 'acts' and multiple 'scenes' within them. It is a device that has a similar effect to Broodthaers' intertitles in his *Voyage on the North Sea* that announce each 'page' in his film. They interrupt any illusory space or singular narrative in the performance by creating discontinuities in the audience's experience and present opportunities to 'reclaim…multiverses' (ibid, p.78) that diverge from the smooth trajectory of the original zoom.

The formerly disembodied narrator of the Eames film, Phillip Morrison, is made present in Act 3 Scene 1 by telling his story, how he was affected by polio, his work on the production of the first nuclear weapons and later extra-terrestrial communications. The performance then spins outwards into space trash and debris, into the relationships between automated car production and sausages, encountering the institutional racism of film chemistry and the agrochemical industries' construction of the ideal lawn. Through occupying and expanding the political and material spaces between scales, *The Superpowers of Ten* bends the trajectory of the zoom and distorts the sense of scale of the Eames film. In the framework of this research this expansive approach presents a way to imagine the potential for new sites to emerge from between scales, rather than relating to fixed spatial or scalar relationships.

It also questions what it means to be *situated* within the complexities presented by the Anthropocene, when multiple scales and branching interrelationships need to be simultaneously accounted for. In this context, it becomes problematic to rely on the middle scale of the human as a relative measure for things in the Universe as the Eames' did, or to simply scale things up and down in linear ways. Timothy Clark argues that when thinking about climate change the 'smooth zooming' of cartographic scales is an 'inadequate concept' and there is a need to address the jumps and discontinuities that appear, which Clark says can have 'incalculable scale effects' (Clark, 2012, p.149).

It is this incalculability of scale that *The Superpowers of Ten* makes apparent and the original does not permit. Clark suggests that 'what is self-evident or rational at one scale may well be destructive or unjust at another'(ibid, p.151). There is an unevenness that makes it difficult to read the scales, let alone predict the effects of human agency. Clark suggests that confusions or 'derangements of scale' can occur if the effects of personal action are smoothly scaled-up to global consequences, where humans are unquestioningly promoted to a geophysical force with an 'illusory agency' over the whole planet.

Clark's derangements of scale highlight the need to think beyond accounts of the middle scale of human sized things when addressing the idea that humans might be responsible for a geological epoch, and suggest a need to think across multiple scales simultaneously. As Timothy Morton asks in *The Ecological Thought*, 'what would middle mean anyway?' (Morton, 2010, p.38). He suggests that human bodies are confounded at both microscopic and macroscopic scales, and inhabit a space of total interconnection; *The Mesh*[20]; a situation where 'there is no definite within or outside of beings '(ibid, p39). Micro-organisms play crucial roles throughout our bodies, *are* an intrinsic part of our biological processes and conversely the bodies of all organisms, including humans, extend outwards into the environment, shaping it as much as they are shaped by it. Morton's ecological thinking, like Clark's, through highlighting the

[20] The Mesh is the name Morton gives to what he describes as 'the interconnectedness of living and non-living things' (2010, p.28)

complication of scales, raises the need for thinking through interconnection and difference simultaneously, to be able to think across boundaries and account for differences in scale, rather than smoothly zooming over them.

The zooming actions of *The Powers of Ten* and Google Maps do not apprehend the complexity of these different scales and present only a simplified relation to space that relies on things being fixed and static. Di Palma argues that Google Earth creates an illusion of a world that is immediately accessible; one that taps into desires for 'unfettered vision'(Di Palma, 2009, p.240) and 'creates the fantasy of an intimate globe' (ibid, p.264) for their users as they go on virtual site seeing tours, looking at where they live and flying across continents.

Practitioners from all disciplines, working with digital mapping tools like Google Maps, need to recognise the illusory nature of the seamless representations which they present. By understanding the ways in which they operate, it opens the possibility to identify differences within them rather than as Di Palma suggests, simply reproducing 'the same image at various degrees of resolution' (ibid, p.260). In locating the discontinuities between these images, and understanding that they are filled with different and animated actants, it presents opportunities to account for their connectivity and social and political relations at different scales.

1.3 Multiple Scales of the Anthropocene

Doreen Massey in her essay, *A Global Sense of Place* 1991, proposes a perspective that in some respects mirrors that of The Eames Office in 1977, floating beyond the furthest satellites looking back towards the Earth. In contrast though, she asks the reader to consider all the differences that they can see and the interconnections between them; the movement, communications, the internet, social relations and links between people as they zoom back towards the Earth. This journey then does not present a smooth transition across scales like *The Powers of Ten* or a singular image like that of Google Earth but in Massey's words a series of 'meeting places'. They are places that can be understood as 'articulated moments in networks of social relations and understandings'(Massey, 1991, p.28).

Massey's understanding of place is not one of geographic boundaries but is formed from within its social relations. Uneven power geometries mean that peoples' experiences of a globalised world differ according to their local situation. The mobility and interconnectivity of a global economy will appear and feel different for a business executive than for a migrant worker hoping to cross a border to find work. These distinctions, the different experiences of scales, mean there cannot be one singular essentialised sense of place, but there are many differentiated experiences of place within the same geographic, political or administrative boundaries.

Massey takes Kilburn High Road in the 1990's as an example to highlight the diversity of experiences, the social identities and differences that contribute to the understanding of it as a place, and the ways it connects to global situations; through extended families, Irish Republicanism and the Iraq War. Like Kim Dovey's[21] later description of a street as an assemblage, the Kilburn High Road can be understood not as a place of 'stabilised being' but in a 'state of becoming' (Dovey, 2010, p.16). Through acknowledging people's multiple relationships to place, new understandings of it are produced, and rather than a singular identity of a place emerging that is potentially insular and reactionary, a '*progressive sense of place'* can emerge, one that integrates in a positive way both the local and the global (Massey p28).

To be situated within this progressive sense of place requires a recognition of a 'global sense of the local' (Massey 1991 p.29), an understanding that neither *the local* nor *the global* can be taken as given, but both are formed through their interrelationships. A similar position is taken up by both Robin Mackay and Reza Negarestani in respective essays in the publication *When Site Lost the Plot* (Mackey ed., 2015). Both Negarestani and Mackay argue that neither the global conditions nor the local address of a site can be known prior to being constructed between the contingencies of local sites and the continuity of global conditions (Mackay, 2015, pp. 258-259). They develop this argument from C. S. Pierce's

[21] Professor of Architecture and Urban Design, Kim Dovey (2010) suggests that understandings of place need to change from a condition of stabilized being to 'places of becoming' (2010 p13) and suggests Deleuze and Guattari's idea of assemblage as a way to approach this.

principles of tychism (absolute contingency) and synechism (universal continuity) to offer an idea of a site that operates between the two principles (ibid 259). Mackay states that:

> …although all local sites are contingent with respect to the continuum from which they are cut there is no absolutely discontinuous site that is irrevocably sundered from universal continuity… one must keep in view, at once, the real difference of the local site and its immersion in a global environment of continuity without ever allowing one to overshadow another.
>
> (Mackay, 2015, pp.259-260)

Neither the local site or the global environment of which it is a part can be separated, but simultaneously there is a discontinuity between the two. There is a cut, 'a Trauma' (ibid p260); the local site cannot access fully the global environment and the global cannot fully describe the local, as such neither the local site nor the universal space of which it is a part can be assumed to be known *a priori* and need to be uncovered. This is what Negarestani describes as 'the ecology of the space of the universal' (Negarestani, 2015, p.225), the horizon between continuity and contingency, proposing that it is only through a procedure of *navigating* this horizon that the local site and the wider environment in which it is immersed can become apparent. He suggests it is like looking through a lens 'that does not produce zooming-in and zooming-out effects by simply scaling up and down the same image' but produces new 'wholly different images across different scales of magnification' (ibid, p.226). Again, zooming can become a generative process, one that produces a ramifying chain of local sites that are transformed on the gradient between continuity and contingency. As with the work of Broodthaers, The Office for Political Innovation or Massey, it is by identifying difference and discontinuity between scales -between that which is local and that which is global- that allows for new possibilities, and new understandings of a site to be created.

Negarestani describes this process as starting in a 'homogenous informational landscape where everything is one and the same', one he suggests is like a desert but could equally be the undifferentiated blue representation of the North Sea that Google Maps presents. It is only through creating a rupture, 'a qualitative difference' in this otherwise 'quantitative horizon' that we can begin to understand this hitherto opaque space. He describes this rupture as an 'epistemic cue' that

presents the first opportunity to organise information, from which a subject can begin to orientate themselves and then iteratively organise and navigate this space (Negarestani, 2015, pp.231-232). Neither the local or global is a given, but needs to be constructed, both local site and global context emerge as they are incrementally constructed through this navigation.

It is the undifferentiated blue space of the North Sea presented by Google Maps that is the starting point of my artwork *Brent Field Navigation* (2016 – ongoing). Zooming in on the North Sea, once the land moves out of sight, has no effect, scaling the map up and down presents the same homogenous blue space, one in which Negarestani suggests, neither the local site nor the global environment are known. Somewhere within this space of the North Sea is the Brent Alpha oil platform, a rig that is situated in what has been the largest producing oil field in the North Sea but has now been exhausted and reached the end of its life, its material and energy distributed throughout our environment and society. It will soon be decommissioned[22]. Its geographic coordinates are 61.000º North, 1.708º East and by using an app on my phone[23] that is connected to a network of GPS satellites, I am able to orient myself to its position on the surface of the planet. Turning to face toward the platform in the North Sea from wherever I am located; let's say for now it is my bedroom in Whitley Bay; it is 10:56pm, my son is asleep in the room next door and we argued about homework before he went to bed, my partner is in the bathroom cleaning her teeth. When I am aligned with the platform, I take a photograph and upload it to my server which is located somewhere near Chester. As I do so a server side script looks up current environmental data from the sea at the Brent Alpha platform[24], the wave height is 0.91metres, their frequency is every 4 seconds, and their direction, South-South-East, and it combines this information with the metadata of the photograph –exposure time 1/25th of a second, f-stop 2, and time and date 2017/09/26 23:01:45. This

[22] Decommissioning of the four Brent oil platforms began in 2017 when the Brent Delta platform was lifted from the North Sea for recycling.
https://www.shell.co.uk/sustainability/decommissioning/brent-field-decommissioning.html
Decommisioning of oil platforms is discussed further in Chapter 3.
[23] I used *GPS Compass Explorer* published by Evgeni Ganchev
https://play.google.com/store/apps/details?id=com.gpsnav.evo.gps2&hl=en_GB
[24] The data buoy is part of NOAA data buoy network and can be accessed here:
https://www.ndbc.noaa.gov/station_page.php?station=63113

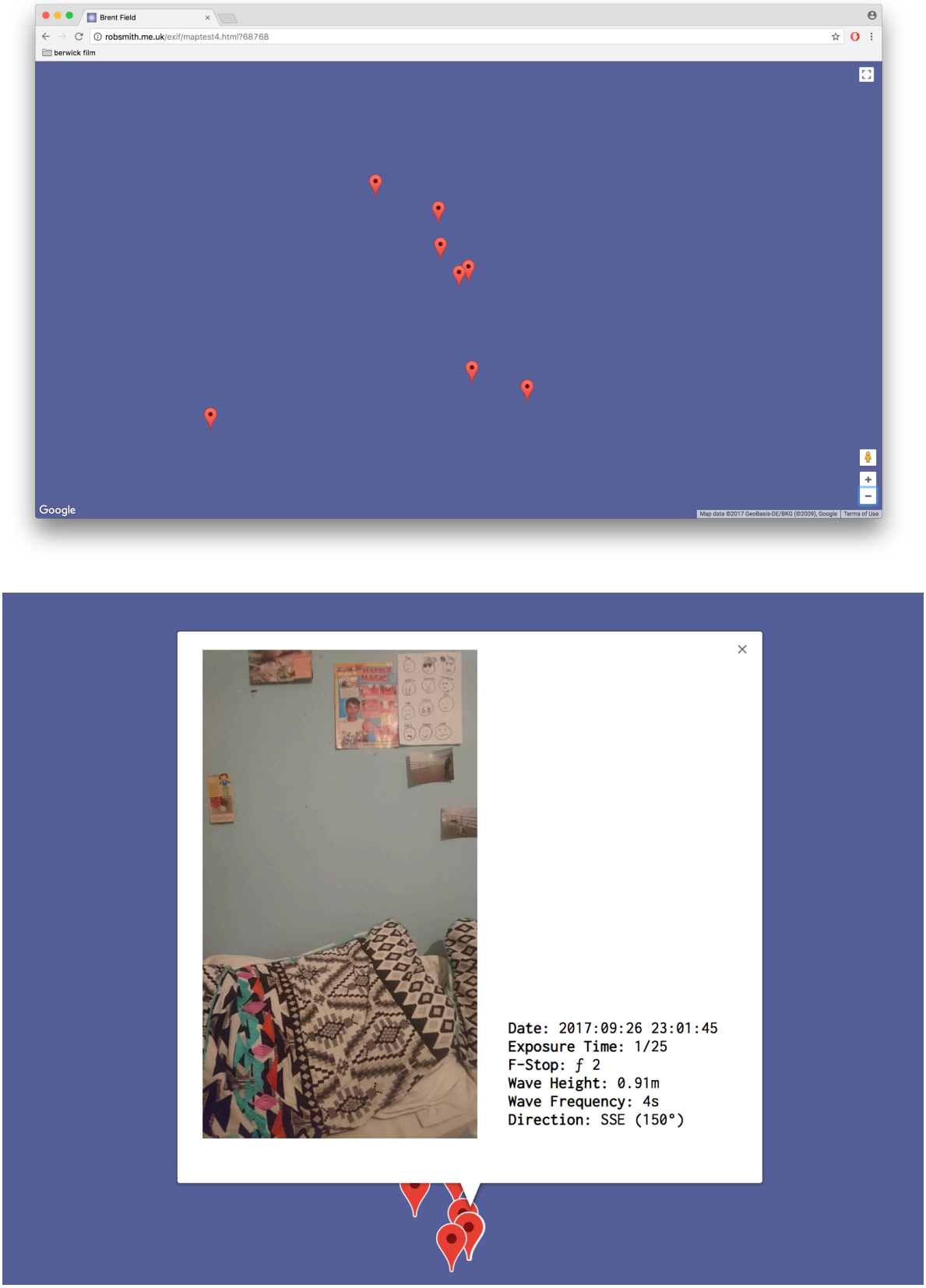


Figure 1.5 Screen shots of *Brent Field Navigation* (2017-ongoing) Online artwork by the author available at http://robsmith.me.uk/exif/maptest4.html (accessed 26 September 2017)

combined data is then located as a ‘pin’ on a customised google map[25], using the GPS location at which the photograph was taken. (figure 1.4, Part 1, pp.2-6)

Each pin on the map opens-up when it is clicked on, to display the image taken with the combined set of data from the sites alongside it. The emerging constellation of pins become the first points of differentiation in this otherwise homogenous space of the unknown sea. As more images are added multiple local sites emerge within this expanding global context ; roundabouts, city streets, a heather covered hill side, unidentifiable public spaces some indoors some outside. The framing of each image, the orientation of the camera and what is in front of it, is contingent on my position relative to the oil rig. As such each image becomes a ‘meeting point’ as Massey suggests, where networks of technology, mobility, and social, political and personal spaces intersect. Each pin becomes a record of my actions and locations, on another scale it becomes a map of my research, expanding in non-linear ways to connect into other technological sites of servers and GPS satellites, utilising the tools and data provided by Google which in turn maps the usage into new and unpredictable sites.

Each point on the map of *Brent Field Navigation* is a local site from which wider knowledge of a larger territorial whole can be navigated, incrementally constructing a territory within an as yet unknown global space. This process, Negarestani suggests, cancels out any conserved relation between the subject and the world, and does not, ‘anchor the subject in a specific place but unmoors the subject within a navigational landscape’(ibid, p.233).

1.4 Conclusions

The processes of locating difference in the otherwise undifferentiated space of the North Sea explored in this chapter have created situations from which new complexities can emerge. As Negarestani’s ‘*navigation*’ proposes, each local point of difference opens a new set of interrelationships from which further possibilities can be found. It is a procedure through which the complex and

[25] I have overlaid the features of the land in the map with the blue of the sea, so that at all levels of zoom it presents a uniform blue space.

perhaps unexpected site of Doggerland as an assemblage of interrelated and lively actants, can incrementally emerge.

This proposition suggests that neither Doggerland nor the North Sea can be entirely known or approached as a self-evident site to be responded to, but requires that knowledge of each is produced from the interconnected mesh of relations within it.

The works *NorthStudioMoonSea* (2017) and *Brent Field Navigation* (2017-ongoing) both propose multiple sites- city streets, hillsides, server farms, bags of water and the architecture of my studio- each presents an animated site from which they expand outside of the geographic boundaries of the North Sea. The North Sea becomes unmoored from its singular spatial representation of it, and by acknowledging that it is constructed from multiple heterogeneous elements, this enquiry moves towards an understanding of the North Sea that can productively generate new possibilities and new sites from its interrelationships.

It is an approach that acknowledges the materiality of things as lively and vibrant actants as Bennett and Latour suggest. Through the interactions between them, new territories assemble to inform an understanding of the North Sea that moves away from a fixed topography, distributing agency across a relational and generative site of Doggerland.

Chapter 2 continues to expand the understanding of Doggerland by examining the interrelationships between the North Sea and the technologies that are used to represent it. Starting from an investigation of the processes of underwater photography, I examine the ways in which different actants converge and assemble temporarily around the photographic apparatus, and ask how they contribute to the composition of Doggerland through this research.

Chapter 2: What role does technology play in the composition of the North Sea?

This chapter begins by looking at how early underwater photographic experiments draw attention to the materiality of the sea. By testing the limits of photography in the liquid space of the sea, the experimental processes of William Thompson (1822-79) and Louis Boutan (1859-1934) not only offered new knowledge through their discoveries, but made visible the apparatus of the camera in relation to the sea, through both its specialized engineering and its failures.

One hundred and fifty years after these first experiments in underwater imaging, the material conditions of the sea still present challenges to methods of observation and knowledge of it. These problematic conditions were made apparent in the unsuccessful search for the missing Malaysia Airlines flight MH370 that was lost in the Indian Ocean in 2014. The sea's rapid movements and volume presented a 'hydrodynamic arena' that confounded visual observation and satellite surveillance (Steinberg & Peters, 2014, p.254). The aircraft's disappearance could be made 'situationally present' through information gathered from remote sensors, computer simulations and other screen based technologies (Bremnar, 2015, p.199) but the sea's depths remained opaque, tragically drawing attention to the material conditions of the sea as a 'limit condition to contemporary human knowledge' (ibid, p.199).

The sea's resistance to being visually represented demands that specialised tools and processes are developed, and as such they draw attention to the materiality of the sea. Bringing the photographic apparatus into contact with water makes explicit the role of technology in producing knowledge of the sea, meaning that the sea cannot be taken as something self-evident, but needs to be understood as *composed* (Latour, 2010, pp.473-474, Harraway, 2016, p.97).

The contemporary tools that are used to construct knowledge of the sea; underwater-cameras, submersibles, sonar and satellite sensors, like their 19th century predecessors, all have active roles in composing knowledge of the sea, and similarly cannot be seen as presenting a position of objective observation.

Through examples of my own experiments with underwater photography and examples of practice from artists Rona Lee and London Fieldworks, I question whether sites like the sea can be understood as remote, when they are formed through the convergence of human and nonhuman actants in assemblages, and ask what role technologies play in the composition of these sites.

2.0 The Sea as a limit to photography

> *I am in absolute darkness. I wait for a moment. Still nothing is visible, not even the red and blue blobs of remembered light floating across my retinas. Blackness. I wave my hands where I am sure they should be seen and feel the air brush across my face, smiling at the unfamiliarity of this situation. I edge into the space, arms ahead, not daring to lift my feet too far from the floor. Scraping forwards my left foot hits something, and I tilt my leg to meet another vertical and lean my knee against it as if for stability. Following the rise, I find the edge of the surface in front of me and rest my waist against it, shifting my weight back onto both feet, anchored again.*
>
> *Drawing a space as wide as my reach, I locate the box and the plastic film back that were not quite where I had expected them. Although I had rehearsed this in the light and knew what I needed to do, now out of sight, yet right in front of me, things felt different; the sheet of film bigger, my fingers coarser, the scents of chemistry touching my nose. The edge of the film curves more now and the grooves that receive the film grind and stick as I push the sheet into place. Is it in? Unsure fingers, careful not to touch the emulsion that will catch the light, look for the corners, first of the dark slide, then of the film, mapping the two against each other. The friction of the dark slide presses home, to lock the hinged edge in place. Confirming this I run my hand over the now sealed object. Repacking the box, sliding the tightly fitting elements back together, I retrace my shuffled steps across the floor to the wall where I find the light switch and the world shrinks back into visibility.*

Photography's essential relationship with darkness seems at odds with its capacity to render things visible. Since the invention of photography people have imagined ways in which it could record previously invisible phenomena. Alejandro Martinez (2014, p.2) reports that Francois Arago's 1839 presentation of Daguerreotypes, to the Academy of Science in Paris, envisaged near infinite possibilities for the process, from recording the furthest star to the microscopic. Within a year of that presentation, Fox Talbot had created the first photographic images through a microscope and John William Draper had photographed the Moon through a telescope. It would, however, be another fifty years before those possibilities of

photography were able to effectively record images from below the surface of the sea because the material conditions of the sea pushed photographic processes to their limits.

Water as a medium presented challenges to photography's ambitions. In the 1880's Swiss researchers François Forel and Hermann Fol had carried out experiments with submerged photographic plates at different depths in water columns showing that light decreased with depth, demonstrating that water was not as much of a consistent or transparent medium as air (Eigen, 2001, p.104). When Louis Boutan created what are usually understood to be the first successful underwater photographs in 1893, he had a good understanding that 'the dense aqueous milieu of the sea' (ibid, p.91) made the conditions of underwater photography different and had the 'particular effect' to 'not simply to expose things, but to put into question the medium in and through which they were exposed' (ibid, p.93).

This understanding of the sea was not something that William Thompson necessarily had in 1856 when he and a friend Mr Kenyan found themselves '*weatherbound*' two miles from home, watching flood water rush around the footings of the bridge they could not safely cross. They wondered if photography, instead of a diver, could be used to survey the bridge for damage, reasoning the process of photography in water would be the same as on land 'provided the sea water could be kept from the camera and that light was sufficient' (Thompson, 1856, p.425).

Thompson and Kenyon rowed out into Weymouth Bay to test this intuition. They took with them a camera sealed in a glass fronted wooden box with a heavily weighted shutter to close it to the light. They lowered it into the sea until the rope went slack as it came to rest three fathoms below the surface. Pulling on the line that communicated with the shutter, they opened it and waited. The camera proved not to be watertight and the light was poor. During the ten minutes that it was submerged, the pressure of the sea caused it to leak and water entered the camera, coming into contact with the photographic plate. Nonetheless Thompson created a photographic image underwater (figure 2.1) 37 years before Boutan.

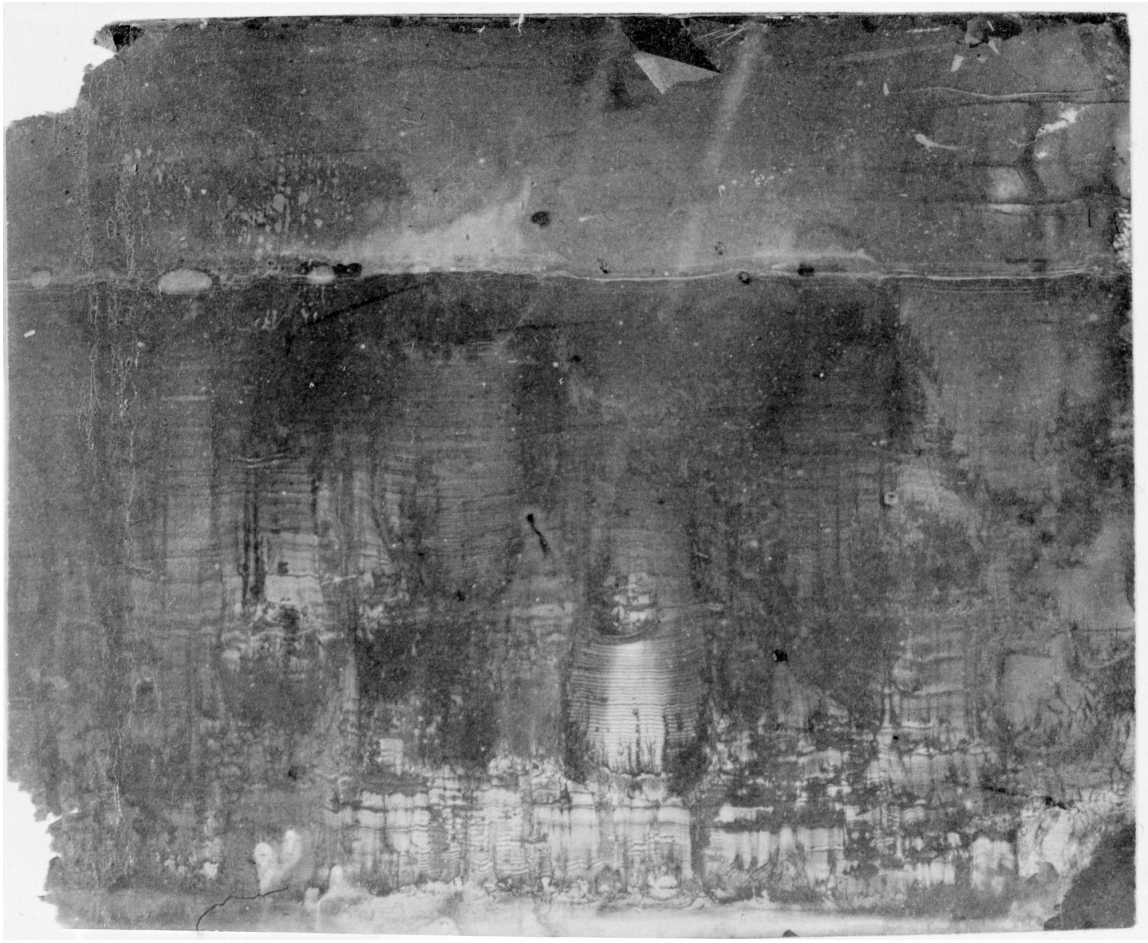


Figure 2.1 The first known underwater photograph (1856) William Thompson. Contact print from wet collodion plate. 5x4 inches. Photographed by John F. Brown, 1985.

Thompson suggests the image might be better deciphered knowing that it was taken in a rocky nook of the Bay 'thickly clothed in seaweeds' (ibid, p.426). Even so, it is difficult to interpret beyond the clearly visible line that marks the level to which the camera flooded (see figure 2.1). The depth of the water in which the camera was submerged will have significantly reduced the light available to the camera, and the resulting long exposure time[26] means that anything moving, like seaweed, would not have been clearly captured in the image. What might appear to be the shapes of seaweed, are more likely to be the marks of the water affecting the wet collodion that Thompson used to sensitise the photographic plate. Thompson however felt he could discern a 'weak' image, and one that he could see had not been inverted as he had expected because of the water and the additional glass in his apparatus (ibid, p.426).

Thompson's experiment is largely unknown, and is only remembered at all because he was 'persuaded' by another of his friends to write to the RSA with an account of it (Brown, 1985, p.895). Those who have published material that acknowledges Thompson's experiment do not present it as a success. Martinez, in the absence of the photographic image, describes it as only a 'partial success' (2014, p.3) based on Thompson's description of the image as 'weak', and Brown (1985) who having found and published the image after 129 years of it being invisible to history, describes Thompsons photograph as 'a gallant and innovative failure' (Brown, 1985, p.895). This perception of Thompson's image as unsuccessful can in some part be attributed to the experiment not going-to-plan and the sea flooding the camera, a failure of the technology as much as the quality or visibility of the image. The comparative '*success'* of Boutan's images in large part was dependent on the technological achievement of keeping the water out of the camera.

2.1 Liquids make the Apparatus Apparent

In underwater photography, there would appear to be a necessary separation between the photographic apparatus and the phenomena being observed or

[26] Thompson submerged his camera to a depth of three fathoms (Thompson, 1856, p.425) (approximately 5.5m), a depth that in turbulent coastal waters will have reduced light levels significantly. He describes that he performed his experiment twice; the first time he opened the camera shutter for 5 minutes and got no image. He doubled that exposure time to 10 minutes on his second attempt that produced the image pictured (ibid, p.426).

recorded, but in bringing water into the camera Thompson's image makes the material processes and the apparatus of photography apparent.

The need to keep liquids outside of the photographic apparatus is a tension that photographer Jeff Wall identifies as being between the '*dry institutions of photography'* and what he describes as a *'liquid intelligence'* (Wall, 1989, p.93). For Wall the 'echo of water' evokes an archaism that holds the memory traces of ancient production methods in photographic processes; washing, bleaching and dissolving. This echo suggests that water is an intrinsic part of photography, and yet it is only allowed into the photographic processes when it is controlled, channelled and contained, and kept separate from the optics of the photographic apparatus; the camera, enlarger or projector, so when seawater flowed uncontrolled into Thompson's camera it created a confusion. Liquid moving through the camera created interference within the process, noise within the optics of the camera that affected the image produced. It highlighted the inadequacy of Thompson's apparatus and the limits of photography to describe the world.

Thompson's image may have not been a success in producing a readable image like Boutan's, but it is successful in making an image made *with* the sea rather than *of* it. It can be understood as an image open to the sea's liquid intelligence. As Bennett suggests of other nonhuman actants, the sea has effects, and within the assemblage of camera and sea, the sea has a capacity to reveal new wet materialities.

Thompson's photograph was a genuine experiment, with no predictable outcome. He had no idea what the result would be or if he would get one at all. Any pre-known chain of cause and effect was suspended from the moment the camera was submerged, to when the plate was developed and printed. It was an action that highlighted unexpected material properties of the sea and the behaviour of light in water. It also drew attention to the role of the camera itself in the formation of the image; its functioning or otherwise, its physical construction and the processes within it; what Vilém Flusser (1983) describes as a key element in photography, the apparatus.

Flusser describes photographs as 'technical images' produced by 'apparatuses' (Flusser, 1983, p.14), and as such they differ from 'traditional images' like paintings. Traditional images signify something in the world and can be decoded in a conventional way. Flusser argues that photographs, as 'technical images', cannot be decoded so easily because they seem not to need decoding. They do not appear to be symbolic but appear on the same level of significance as the world that they represent; appearing as 'symptoms of the world' rather than symbolic representations of it (ibid, p.15). This automatic quality of photography is possibly what led Thompson to suppose that his study of photography would allow him to illustrate 'the objects of Natural History more accurately' because 'I unfortunately cannot use my pencil' (Thompson, 1856, p.425). This belief was shared by others in the 19th Century; that photography was a way to remove the subjectivity of the human hand, human interpretation, from representations of nature and move towards a 'noninterventionist or mechanical objectivity' (Daston & Gallison, 1992, p82). Flusser asserts that 'the objectivity of technical images is an illusion' (Flusser, 1983, p.15) and in fact technical images are just further abstracted than a conventional symbolic image. As such he argues there is not only the need to decode the intentions of the person who created the image but also a need to decode the processes that go on within the 'black box' of the camera and see past the technical image's 'magical fascination' (Flusser, 1983, p.16).

Flusser goes on to argue that the actions of photographers are conditioned by the apparatus, and the possibilities of the program within it[27]. The output of the camera can never be immediately known to the camera operator and so is hidden from them. The photographer becomes a 'functionary' (ibid, p.27) of the apparatus, only able to feed the camera input and receive output, only able to 'play' within the parameters of its program and having no control or understanding of what goes on inside the apparatus (ibid, p28). For Flusser, writing in the 1980s, the camera is a prototype of the technological apparatuses that he saw as becoming 'decisive' throughout society (ibid, p21). He identified within photography an 'apparatus

[27] Flusser's text was addressing analogue photography, but today's ubiquitous digital cameras and DSLR's are, despite all their functions and options, still ultimately limited by their program (Flusser, 1983, p.25) and further abstract their processes from the photographer.

future' (ibid, p80) that marks a movement from an economy of the material exchanges to a one of digital information; from management structures to computer chips; what defines the apparatus is that they operate as black boxes that only receive input and generate output according to their program.

Flusser suggests that photographers can provide an example for how to work in this context. By drawing out key concepts within photography; of image, apparatus, program and information, Flusser draws attention to the processes at work within the black box of the camera and asks questions of both the objectivity of the camera and the freedom of the photographer that operates it. Flusser suggests that photographers can exercise freedom and 'play against the camera'. A photographer can do this firstly by 'outwitting the camera's rigidity', secondly; 'to smuggle human intentions into the program that cannot be predicted by it', thirdly; to 'force the camera to create the unpredictable, the improbable, the informative' and lastly; 'one can show contempt for the camera…and turn one's interest away from it' (ibid, p.80). What Flusser calls 'experimental photography' uses these methods to 'knowingly play against the camera'. In being conscious of the basic problems of photography; image, apparatus, program and information, a photographer is able to 'release themselves from the camera' and generate unpredictable information, images that are not within the program of the apparatus (ibid, p81)[28].

Thompson did not intentionally or knowingly set out to play against the camera in the way Flusser describes, but Thompson's image would fulfil his definition of experimental photography. There was no established method for how to take a photograph, he needed to imagine a new set of possibilities, a new program for the camera. His experiment generated unpredictable information within the camera, an image that draws attention to the processes of its formation, the flow and effects of the liquidity of the sea within the black box of the apparatus.

[28] These are 'experimental' approaches to photography have been explored by artists like Susan Derges, who places photographic materials in moving water at night or Daro Montag who buries film and makes visible the microbial actions of soil bacteria on the film.

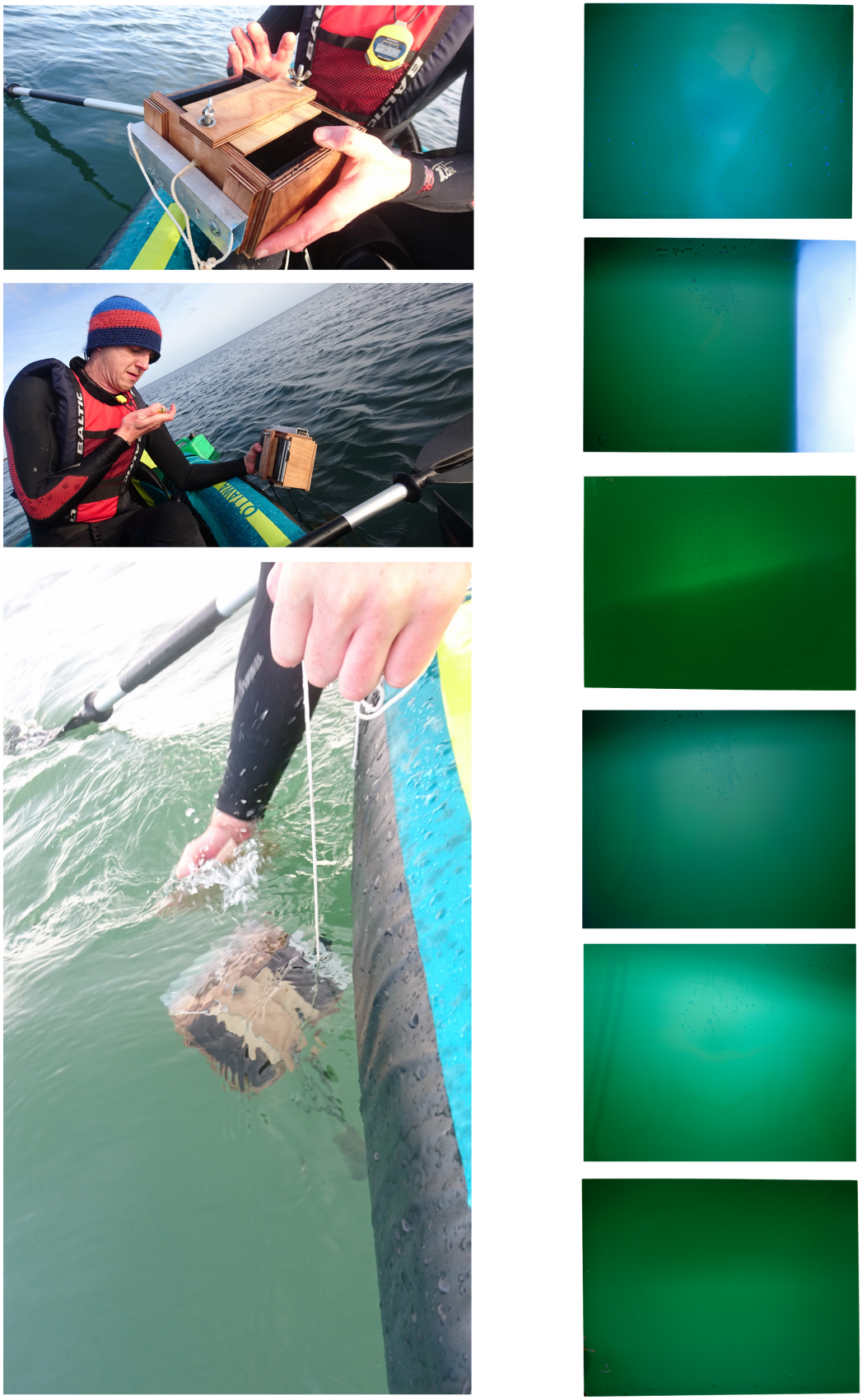


Figure 2.2 Left: Making of the underwater photographs 2018. Photographs by Sophie Buxton
Right: Instances of Drift. Rob Smith 2018. C-Type Prints 108 x120 cm

2.2 A Photographic Assemblage in the North Sea

With an awareness of Thompson's image, I produced a series of underwater pinhole photographs titled *Instances of Drift* (2017-18) (Part1, pp.11-13). By choosing to use a pinhole camera underwater, I created a deliberately leaky apparatus, one that is literally porous to both water as well as light. Making the photographs was an experimental process that allowed water into the camera. It was a process that produced unpredictable outputs from the apparatus of photography and presented a way to explore the new interrelationships that formed around it by being immersed in the sea.

> *I paddle out into the North Sea with a friend, away from the land with the pinhole camera and some 5x4 film backs packed in a watertight plastic box. Beyond the rocks and the now miniaturised landscape of houses and promenades I prepare the camera. The sea is calm but out here there is no shelter. Even the small waves move the boat, and the breeze pushing at the bow chills wet hands, cramping them with cold. I take a meter reading; 30 seconds at f64. Double that four times, an estimate to compensate for the loss of light below the surface. I clip a weight to the camera's base and a long line remove the dark slide and the apparatus is set. Starting the stopwatch, I remove the shutter and let go, watching the camera slowly sink, releasing occasional bubbles until it disappears from view. The unseen pendulum of the camera pulls tight on the line connected to the buoy and it swings away from the edge of the boat. We are both in motion, drifting.*

Drifting suggests an un-intentioned movement, pushed and pulled by the whim of the sea like plankton (plankton's etymology lies in the Greek for wanderer or drift, and it is defined by its inability to swim against a current). Yet to drift is also to be open to other currents and flows, the desires and affects that reterritorialize the assemblages of Deleuze & Guattari and Bennett. It brings to mind the Situationist methodology of dérive (drift in English), where practitioners 'drop their usual relations' to a place or environment and allow themselves to be 'drawn by the attractions of the terrain and encounters they find there' (Debord,1956). Drifting is a process that requires an immersion in environmental conditions, and willingness to be affected by them. This is an experience Jon Anderson (introduction, p.40) describes through being in a kayak; of how being level with the water reorients his relationship with the sea. With two stokes of his paddle he comes 'adrift' from the land, floating and buoyant in a space that envelopes him in mobility (Anderson, 2014a, p.107). It is a change in relations to the sea that he explores further

through his engagement with surfers. He describes how a surfer moves within the ‘flow’ of a wave, and experiences it as ‘being a part of the wave’; they are fully immersed within their environment (Anderson, 2014b, p.77). For Anderson, the surfed wave is an example of what he terms an ‘actor centred geographic becoming’, a place of ‘convergence’ between surfer and wave (ibid, p.82). Through a change in situation, adjusting a person’s relationship to the sea by being within *the flow* or *adrift,* places can be comprehended not as fixed or stable entities but as assemblages, around which an understanding of place as provisional and relational can emerge (ibid, p.77).

When I set the camera adrift from the side of the kayak in the North Sea it is a similar process. There is a ‘convergence’ between the camera and the sea as it fills with water as there is with surfer and wave. It territorialises an assemblage around it; of my human intentions, my imprecise actions, the histories of Thompson, Boutan and others, but also the fluid mass of the sea, the now touchable cold water, the light from the sun, the pull of the wind and the tide. Around the apparatus of the underwater photographs, a provisional and relational site becomes apparent, one that enables new spatial and material understandings of the North Sea to emerge.

The process of making the image was to allow the camera to be fully immersed within the sea, to drift and be open its effects. As water and light moved into the camera, between the single point of the pinhole and the continuity of the image plane on which they both left their traces, the image formed was not a representation as a form of knowledge, in the way that Thompson had conceived of it, but revealed the camera as a site, a temporary convergence of human and nonhuman things that territorialised around my action with the camera, where *things* interact.

I did not expect to produce a representational image. My camera was deliberately mobile in the water and no objects would have remained stationary enough to have been caught on the film during long exposures (up to 12 minutes on some occasions) but allowing water into the dry optical apparatus of the camera created unexpected and unpredictable results and not the smooth flat colour field I had supposed. The images were marked by the effects of what converged in the

apparatus; blue spots, dark lines, reflected water surfaces, scratches, dribbles and blotches. The wet film reacted with the salt, was marked by drying, its soluble anti-halation became sticky and soft. At one point the wooden camera box became so swollen in the water that the simple hinged shutter jammed, making it difficult to shut. Another time, tired hands opened a film back and erased the image I had created. These interactions between myself, the camera, the North Sea, light, the water in the camera, the chemistry of the film and the darkroom - the convergence of these things - are all recorded within the images produced.

2.3 Technological assemblage of the sea

At a similar period to Thompson's photographic experiment other technologies were being developed that tested the limits of human knowledge in the sea. As these new technologies were deployed and increased in their sophistication, new technological assemblages of the sea converged around them, and as with photography, these images of the sea were not objective or removed but were formed through a convergence of the technology with the conditions of the sea in relation to the people and the motivations that drove them.

The development of line soundings and bathymetric charts in the second half of the 19th century offered new insights into what lay below the surface of the deep ocean, and they have been followed by a succession of technologies that has continued through the development of sonar in the early 20th Century, to the contemporary use of gravitational mapping from satellites. Each technology incrementally contributes new information to an expanding image of the sea, transforming it from a place that was as equally misunderstood as it was unknown, into a place that could be measured, mapped and explored.

These representations of the sea are not singular discreet images, but composites formed by people who are a part of the assemblages that converge within the sea. The histories of the people who developed the technologies, their motivations and the economics and desires that drove them, shape the representations and

knowledge of the sea that are produced. Helen Rozwadowski[29] suggests that the interpretation of line soundings in the late 19th century; that saw the image of the Atlantic seabed transform from a 'violent, rugged place' to a 'flat, quiescent environment', (Rozwadowski, 2008, p.70) were heavily influenced by the need to encourage support and investment in a transatlantic telegraph cable, and she describes how more recent depictions of the sea as a 'frontier ' were used to 'evoke' the wealth of resources to be extracted from it (Rozwadowski, 2010, p.522). It is important then to understand that the representations themselves are composed within the complex interactions between actors of all kinds and understood in ways that 'reflect the activities and desires of historical actors' (ibid, p.522).

This desire to visualise and to know the depths of the ocean was questioned by Rona Lee during a residency at the National Oceanographic Centre, Southampton (NOCS) in which she explored methods of underwater survey and mapping. Her work *I Want, I Want, I Want (*2011), presents photographs of the oceanographers she worked with, eyes closed imagining the deep, alongside fistfuls of sediment from the seabed, made fixed, fired and then chromed. Shaped by Lee's fingers, these objects evocatively clutch at the unknown, in a gesture that questions the human drive to know what is invisible to them and the role of touch, the haptic, in imagining new understandings of the deep sea. Increasingly the sea is studied from landlocked offices using satellite data and remote sensors. Each technological advance, from line sounding to sonar, from diver to remotely operated submersible, has displaced the materiality of the sea a little more from the oceanographic image.

As Wall identified a liquid intelligence in photography so Lee cautions against 'dry thinking' (Carter, 2008, cited in Lee, 2011, p.217) in oceanographic practices. The now almost ubiquitous computer modelling that is used for bathymetric mapping, Lee suggests, drains the ocean, rendering the seabed visible, removing the liquid, the fluid qualities of the sea that define it (ibid, p.23). It is an approach that Lee

[29] Helen Rozwadowski is a marine historian whose book *Fathoming the ocean: the discovery and exploration of the deep sea* (2008) narrates the people, politics and technologies that have contributed to knowledge of the ocean

argues prioritises the optic over the haptic, reinforcing ideas of ‘detached observation and disembodied objectivity’ within scientific representation (ibid, p219). During her residency at NOCS, Lee played with the conventions of these modelling technologies, producing new images of the seabed that exaggerated scales, and inverted the depths into heights, a process that highlights the artificiality, the interpretive qualities, of these visualisations. Materialising these through 3D printing processes, she created the work *And All The Seas Were Ink (*2011) that brought this new imaginary of the world’s oceans and seas into the physical space of the John Hansard Gallery in Southampton.

Bruce Gilchrist (2015) also considers the role of technologies in shaping what remote might mean, through his practice with Jo Joelson as London Fieldworks. He describes technology as part of an ‘enigmatic mesh’ along with natural and psychological factors that frame the remote. Whether it is through a failing generator that highlights the fragility of the safety net which technology provides (*Polaria,* 2001), or data being transmitted from one site to be received and interpreted at another (*Syzygy,* 1999) or the details of a satellite link being set up in the Scottish Highlands (*Remote Performances,* 2014), the technologies employed and how they function in each case shapes the experience of remoteness in different ways. For Gilchrist the remote is not a geographic condition, but like wilderness it is ‘an invention of the imagination, a state of mind’ (Gilchrist, 2015, p.87). The *Contemporary Remote* is extended through technologies to ‘create the appearance of access to places and things through which to engage the imagination’. Whether that is London Fieldworks’ actions on a Hebridean island or the arctic circle, or the Rosetta spacecraft orbiting a comet, Gilchrist states ‘It draws them nearer’ (ibid, p.89). These sites are no longer remote, in the sense of its etymology, removed, but drawn closer into a complex network of relations by technologies, and are irremovable from the technology that renders them visible.

The contemporary space of the North Sea is no exception, it can no longer be seen as remote, but through technology it is drawn nearer to societies on land. The flow of 1970’s gas and oil from the North Sea continues to course through streets and homes, supplemented now with electricity from an expanding number

of offshore wind turbines. Perceptions of the North Sea are changed through these industries too; oil and renewable energy companies have extensively surveyed the seabed through sonar and seismic scanning; navigation is increasingly carried out through Global Positioning Systems (GPS) and Automated Identification Systems (AIS) that plot ships' movements in real time on a screen[30] and the sea bed is now criss-crossed with data cables, power cables and pipelines. The North Sea is brought closer into proximity with human activities through both its physical connection to the material spaces of these technologies, and its representation through this technological space, entangling the North Sea with technology in new assemblages.

2.4 Remote Viewing in the North Sea

Amongst this assemblage of technology are a network of data buoys that provide real-time environmental data about the conditions in the North Sea, operated by The Centre for Environment, Fisheries and Aquaculture Science (Cefas). The data from these buoys can be accessed through online maps[31], screen-based interfaces that give the appearance of access that Gilchrist identified by providing a feed of data that is interconnected with environmental conditions beyond the immediate perceptual field. This interrelationship between my own local position and these 'remote' sites is something that my investigation has returned to several times during this research, in *Brent Field* (2015-ongoing) and *Sea Gem* [1965-now] (2018).

My earliest engagement with one of these buoys was when the opportunity arose to organise a Coordinate Remote Viewing (CRV) session with Stuart Tait, Warwick Stafford Fellow at Northumbria University 2015-16, and the artists collective AAS which Stuart is a member of. I selected the perhaps aptly named Dowsing WaveNet data buoy as the 'target' for the session. CRV is a method for acquiring information through psychic means about a designated remote site using a geographic coordinate as a prompt. AAS use a method set out in the *Co-ordinate Remote Viewing Training Manual* produced by Stanford Research Institute (SRI, 1985,1992) that was supported as a part of the USA government's 'Stargate'

[30] The current positions of ships in the North Sea can be viewed here: https://www.marinetraffic.com/en/ais/home/centerx:3.9/centery:54.7/zoom:5
[31] For example the map provided through Cefas website, http://wavenet.cefas.co.uk/Map

programme. The manual sets out a strict method by which a *Remote Viewer* working with a *Monitor* who guides the process can, through six defined stages, work from initial site impressions, build aesthetic information and detailed site analysis and finally in the later stages, render spatial and three-dimensional models of the target site.

The session was organised so that the remote viewer was located in London and observed by a group of researchers in the Northumbria Studios at Baltic39 in Newcastle. In the centre of the table in Newcastle I placed a video camera on a motorised turntable to record the event. From this central pivot, I took compass bearings and plotted lines in the direction of the data buoy and the remote viewer's locations and on these lines respectively placed two laptops. One was used to display data from the remote site using the Cefas website and the other showed a video link that would allow the CRV session to be observed. (additional images and a partial transcript from the CRV session can be seen in Part1 pp.8-10).

In the initial stages of the process the information that the remote viewer produced; his drawn 'ideograms' and sensory impressions, corresponded with what we knew about the site and the current environmental conditions at that time. However, as the session continued, the viewer's information diverged from this and his architectural description of the site and the three-dimensional model produced appeared to have very little correspondence to our knowledge of the remote site of the data buoy in the North Sea. There was a sense of disappointment amongst the group that the result did not match our expectations and a feeling that this CRV session had not been a success.

Retrospectively though, when reviewing the documentation, I began to realise that there were other correspondences not to the data buoy but with the overall design of the experiment. There appeared to be significant similarities between the model produced and the topography of the space at Baltic39; the deliberate layout of the table and its relation to the architectural features of the building. The two bricks in the model were arranged in very similar ways to the laptops on the table, and described as 'definitely meant to display something quite authoritative'. The green cigarette lighter in the model was described as something 'like a stone block with a

plant pot on it' the purpose of which is 'redirecting people in the space'. This description has similarities with the camera on top of squat block of the rotating turntable and its function to create a record of the event in a way that directed the viewer's gaze to all elements of the session's set up. This is further reinforced by the remote viewer saying it was 'of human scale but not a person'. The camera presents a scaled perspective, a person's viewpoint through which the space can be interpreted. Further architectural details of the 'solid wall with glass in it' corresponded with the features of the building at Baltic39, and the loosely arranged books described as 'the sort of thing where you can get information' also corresponded with the papers about the site that were distributed on the table's surface.

This may well reflect a confirmation bias, a selection of data that confirms one's beliefs and desires while discounting that which does not, something that remote viewing experiments have been criticised for (Shermer, 2010, p.10). As an example, Dunne and Bisaha's 1979 experiment that formed part of the early SRI investigations into Remote Viewing only accurately describes 4 out of 8 target sites, and concludes that it is possible to 'give significant descriptive information about an unknown location' while appearing to ignore that 50% of the time that this was not the case (Dunne and Bisaha, 1979). The aim of my Remote Viewing session though was not to test the effectiveness or validity of the methods used, but to raise questions about how images of the remote site were composed, both through the CRV method and through the gathering of data from the data buoy. If, however, there was a confirmation of my own bias, then to interpret the model as the table which sat between the remote viewer and the data buoy, reflected my growing understanding that a remote site is understood through the entire apparatus of its viewing and not just the image created.

The data buoy in the North Sea is not an isolated site, discrete and locally bounded, but one that is a composite of technologies and human motivations. As the site is studied, whether it is through CRV or through the data from Cefas, it

Figure 2.3 Table top in the studio during cognitive remote viewing (CRV) session. Laptops, turntable, and other objects arranged on the table. Photograph Stuart Tait.

Figure 2.4 Still from the video link with the remote viewer, showing 3-dimensional representation of the target site produced by Ralph during the CRV session.

expands the buoy from a singular geographic point in the North Sea, increasing its complexity as data is gathered, recorded and interpreted.

Like photography, remote sensors cannot offer a perspective of disembodied objectivity, the black-box of their apparatus can be opened, examined and questioned. The data buoy is a site at which different technologies, intentions and design converge and can be seen to be a part of a material and distributed network of multiple parts. It consists of concrete anchors, elastic tethers, a spherical corrosion resistant hull made of AISI 316 Stainless Steel, an Iridium Satellite transmitter, electromagnetic waves with a wavelength between 1616 - 1626.5 MHz, a constellation of 66 satellites in low earth orbit, data centres, miles of cable, multiple servers and racks at different geographic locations, and other boxes, switchers and routers. This is just to get the data from the North Sea to a computer to store it in a database. An equally complex set of hardware and software needs to converge to retrieve it and make that data appear on my screen. This single buoy is a part of an organised and planned network of buoys. They form a larger technology that is designed and shaped to provide a kind of information environmental scientists believe they need. The numbers produced that correspond to the changes in wave height, frequency, amplitude and direction are evaluated and interpreted, inferences are drawn from them. Predictive models are constructed, risks of flooding and tidal surges assessed and in turn policies and budgets and planning at regional and national levels are informed.

2.5 Composition

Scientific instruments do not just represent nature, they are part of an assemblage of technologies, scientists, politicians, data, that together compose a model, a representation, shaped through motivations as well as knowledge. They are not however, always understood in this way and scientific facts are conflated with nature. An example of when this became apparent is described by Latour, through events around what came to be known as ‘Climategate’ in the run up to the 2009 Copenhagen Climate Summit (Latour, 2010, pp477-479). A controversy arose around email exchanges between climate scientists obtained by hacking servers at The University of East Anglia. When they were published, they appeared to show that the ‘scientific facts’ about climate change had been

'constructed...by humans'. 'Squabbling humans assembling data', 'refining instruments', interpreting 'spotty data sets'. What Latour despairs at is not the dubious actions of climate change deniers, but that both proponents and sceptics of anthropogenic climate change 'shared the same idealistic view of Science'. Latour describes how the sceptics held that if the facts are constructed they cannot be true, and the proponents held the idea that to acknowledge that facts are constructed opens them to discussion, and so cannot be true either, rather than taking the opportunity to discuss the 'disputability' of science as well as politics. Latour argues that rather relying on modernist oppositions of what is constructed or not constructed, he says the question we should be asking is what is composed well and what is not? (Latour, 2010, p478)

Latour chooses the word composition to emphasise 'that things have to be put together while retaining their heterogeneity' (ibid, p474). If things are put together then they can be taken apart again, be de-composed, to be reconfigured, reformed and revised. Implicit in composition then is de-composition and reversibility. The process of composition is not one of inevitable progress or one that reveals a pre-existing world of truth, but a slow process of assembling and reassembling, one that acknowledges that it 'will never make a whole, but at best a fragile, revisable, and diverse composite material' (ibid, p474). Donna Haraway (2016) also adopts the processes of composition and compost, declaring that she is 'compostist not a posthumanist' (Haraway, 2016, p.97). In the word play of com-post as opposed to post-human, and human and humus, there is a real sense of the need to 'chop up' and decompose the species human as Homo, (ibid, p32) and offer alternatives to the Anthropos presiding over the Anthropocene. Within this '*compost'*, Haraway sees '…critters - human and not - become-with each other, compose and decompose each other at every scale and register of time…in ecological evolutionary developmental earthly worlding and unworlding' (ibid, p97). It is a move away from defined things and defined terms that put an emphasis on *how* things are put together, how they interact, become-with, each other. It is a process of taking apart as much as progressing forwards by putting together. A process that can offer new perspectives and narratives, which like Latour's *Compositionism* does not reveal a pre-existing, *a priori* Nature but a process of 'relentless contingency' where 'Natures, Cultures, subjects and objects do not pre-exist their

intertwined worldings' (ibid, pp12-13).

One example of intertwinement and composition that Harraway presents is a project led by artist and researcher Beatriz da Costa, called *PigeonBlog* (Haraway, 2016, pp20-27). In the summer of 2006, this project saw pigeons flying over Los Angeles with air pollution monitoring backpacks; gathering, streaming and sharing air quality data and providing a counter-narrative to 'official' governmental air pollution monitoring. It is a project that brought together many different participants; artists, engineers, pigeon fanciers, activists, citizen scientists and the birds, in relation to mobile telephony, electronic sensors, streaming and web platforms. What Haraway draws out of it is the relational complexity of the project, the interspecies relationships, the way in which participants 'rendered each other capable' within it. *PigeonBlog* is composed of these interrelationships; the trust between pigeon and handler, the trust that needed to be built for da Costa to enter the world of the pigeon fancier, the careful design of the pigeon's 'backpack' to enable the bird and not hinder it.

As with my practice led investigations, the technology da Costa uses is a part of the composition and the interrelations that shape *PigeonBlog*. The sensors are not external, remote in the way that a black box on a lamp post is, it is an entangled part of the becoming of the project. The findings of *PigeonBlog* and the people who worked on it were enabled by the technology that was used, but equally the technology was enabled by them and through the pigeons. The pigeons gave the sensors mobility, the backpacks they wore were developed with care and cooperation between engineers and pigeon handlers; people, animals and technology are drawn together in what Haraway describes as a process of 'building hands-on multispecies trust and knowledge essential to joining the birds, technology and people' (ibid, p22). These complex compositions are what Haraway describes as 'String Figures'. A cat's cradle game of strings composed between players; figuring and refiguring new forms, new patternings and connections between hands; they are *thinking* as well as *making* practices (ibid, p14). It is a process of telling stories of the interrelations between things, the *becoming-with* in projects like *PigeonBlog* are a way to describe the practices and processes that compose knowledge and to offer alternatives to the dominant narratives that shape relationships with the planet.

With the recent proliferation of internet enabled devices, from phones to fridges, data and technology are increasingly composing contemporary spaces, an idea explored through the exhibition Big Bang Data[32], which set out to explore 'how data is transforming our world' (Somerset House 2015). The exhibition was entered through a work by Timo Arnall, *Internet Machine* (2014). This three-screen immersive video mechanically panned over the hardware of a server farm, from server racks to cooling systems, revealing the scale of the mechanics at the backend of Google searches and casual browsing, that usually remains unseen. This theme of the materiality of the internet and its data continued throughout the exhibition. Displays of the subsea cables and maps of their global network sat alongside projects like James Bridle's, *Where the F**k was I?* (2011). This work was produced by extracting hidden location data from his phone to recreate his movements throughout a year through 202 Maps and 35,801 locations, exposing the extent to which data is geolocated and a material part of the configuration of contemporary space.

The work in the exhibition that for me most emphatically traced the ways in which technological tools are shaping geographic space and the ways that people experience it was Forensic Architecture's video, *Liquid Traces - The Left to Die Boat* (2014) [33]. Through material traces that data has left in call logs, satellite imagery, AIS records and photography, the work reconstructs the journey of a boatful of migrants attempting to escape from Libya to Lampedusa in 2011. The Mediterranean Sea at that time was, according to Forensic Architecture's commentary 'the most surveyed waters on earth' (15:30). The sea to the North of Libya's coast was a NATO maritime surveillance area that in addition to ships and planes, was surveyed by a 'complex assemblage of remote sensing technologies' (2:38). The use of AIS tracking, coastal radar stations, synthetic aperture radar imagery from satellites meant that the 'sea's liquid waves are supplemented by constantly pulsating sea of electromagnetic waves' (3:25).

[32] Big Bang Data was an exhibition at presented at Somerset House, London 03 Dec 2015- 20 Mar 2016 http://bigbangdata.somersethouse.org.uk

[33] Details of the work and the video presented can be viewed here: https://www.forensic-architecture.org/case/left-die-boat/

By tracing data through the hybrid space of technology, politics and the sea, and cross-referencing multiple sources with witness testimony, the video creates a timeline of events that make visible the circumstances through which 63 migrants lost their lives. The narrative they present is created within the technological assemblage of the sea and tells of responsibilities that were not acted upon and hierarchized space that can be traversed quickly by the privileged but which is perilous for those who are not. Revealing the processes and the actants at work within the assemblage of this maritime zone, this is research that repurposes the tools of surveillance to become evidence and a method to compose counter-narratives to those of state actors through the material traces that mark the technologically surveyed space.

2.6 Return to Weymouth

To conclude this chapter I return to Weymouth Bay, perhaps close to the place where William Thompson created his first underwater photograph and where Simon Faithfull sank his boat rigged with cameras, to watch it transform into a reef, in his artwork *Reef* (2014). In this site at which the two events converge, separated by 150 years, both men had a desire to see beneath the sea and believed that the apparatus of photography would enable them to do that. Faithfull's boat was rigged with five waterproof cameras that would stream live video from the bottom of the sea and observe while the hull was transformed from human wreck to a new underwater ecosystem, a reef. The cameras failed after six days of broadcasting. When Faithfull's boat moved through and below the surface of the sea, it crossed a threshold into a different kind of space, one that is, as Bremner suggests when discussing the disappearance of the missing Malaysian airliner MH370, indifferent to human ways of knowing (Bremnar, 2015, p.199).

As with Thompson's photographic apparatus, an assemblage temporarily converged around the transmission from Faithfull's forming 'reef', an emerging space of interrelations that as Andersons suggests, creates an understanding of a site in the sea that is provisional and relational and in motion within the sea. When the transmission from *Reef* ended, this site was again decomposed and recomposed in new forms. Green tinted images of occasional fish swimming through the wheelhouse of the boat, were replaced with a new site made up of

umbilical cables, buoys, line of site wireless transmitters, a cottage on the edge of a caravan park, streaming servers, the global path of Hurricane Bertha, stories of local animosity to the project and potential sabotage.

The reason for the live feed stopping is unclear, but the composition of Faithfull's work changed when it did. In Faithfull's performative lecture *13 fathoms* (2014)[34], he talks about multiple sites of the sea that emerged in relation to this project, and how when the boat sank below the surface it 'left our timescale of missed appointments, plans for the future and diary entries… and enters into a geologic time' (Faithfull, 2014, 44:00). Faithfull's *Reef* proposes a site that is temporally composed, where change and transformation of site is implicit in the work and it begins to suggest a site that emerges in different forms at different times. Chapter 3 will explore this implied temporality of site through the proposed formation of anthropogenic reefs in the North Sea formed from disused oil platforms, and it explores how different time scales of human time and geological futures are active in their composition as a site.

[34] A recording of the lecture can be seen here: http://www.simonfaithfull.org/works/13-fathoms-2/

Chapter 3: Temporalities of Sites in the North Sea

This chapter discusses how artists' practices can inform a temporality of sites, with a particular focus on John Latham's engagement with the mountainous heaps of shale known as *bings* in West Lothian (1975-76); the by product from Scotland's first oil industry before it moved offshore. I argue that Latham's approach to the bings and his ideas of event structure can inform an understanding of these mounds that moves away from them being perceived as waste matter, towards a generative conception of a site. It is an approach that can offer new narratives of how industrial sites relate to a landscape and I ask how these ideas can be applied to inform approaches to the decommissioning of oil and gas infrastructure in the North Sea.

A little over 50 years after it began, the North Sea oil and gas industry is coming to an end. In 2018 the number of new wells being drilled in the North Sea reached its lowest since 1965 (Vaughan, 2018), the year that the exploratory drilling rig *Sea Gem* first discovered commercial quantities of hydrocarbons under the North Sea. It is in the context of this decommissioning process, that I explore the histories and sites of Sea Gem, a site that I suggest connects the beginnings of the North Sea oil industry to its possible futures.

Through a practice led investigation of Sea Gem, I develop ideas of the temporality of this site within my artworks, *Sea Gem[1965-now]* (2018) and *Sea Gem: Screen Contact* (2018). Working with archive newsreel film of the Sea Gem shot in 1965, I created a three-dimensional computer model of the rig, that is presented within the works. By addressing Sea Gem through this model, these artworks produce a continually changing encounter with the site that remains offshore, and present an eventful engagement with it, around which new narratives of the site can converge.

3.0 Time and Events

The recent exhibition *Offshore: Artists Explore the Sea* (Ferens Art Gallery & Maritime Museum, Hull, 2017) presented Emily Richardson's film *Petrolia* (2005). Its time-lapsed footage cuts between sites of the North Sea Oil industry in

Scotland; the Grangemouth Oil refinery billowing out clouds of gas, ship building cranes in Glasgow, and a redundant oil platform *Petrolia* sitting in the Cromarty Firth, attended by passing boats and other rigs being pulled to-and-fro. Seeing things at different speeds can make landscapes that might appear natural, strange and monstrous (Morton, 2010, p.43). In *Petrolia*, it is not the growth of plants, or the changing seasons that are transformed as in a nature documentary but the colossal machines of the oil industry, which become insect-like, 'sci-fi creatures', frenetically scuttling on the water (Stone, 2010). They become transient like the passing of night and day in the film, and the weather that sporadically lashes the camera. The film unsettles the viewer's relationship to the infrastructure of the oil industry through its shift in timeframe, not revealing its physical magnitude but its appearance as an 'industrial phenomena' in the landscape (Richardson, 2012). It is a view that foreshadows the story of the oil industry in Scotland, its decline, the decommissioning of the oil rigs of the North Sea, and the uncertainty of the redundant rigs in the Cromarty firth.

While considering the future trajectory of decommissioning in the North Sea, and the suggestion that redundant rigs could be used to create anthropogenic reefs (which I will examine more closely later in this chapter), there is a need to account for how these gigantic steel and concrete structures would slowly transform and become a part of the phenomena of a landscape and not separate from it. It requires an act of imagination to span the more-than-human timescales involved, one that is reminiscent of Robert Smithson's 'ruin in reverse'. This is an idea that suggests that *'buildings do not fall into ruin after they are built, but rise into ruin before they are built*' (Smithson, 1967, p.72) - the entropy and collapse of things is inherent within their construction and is a process that is accelerated in the sea. As Smithson stood watching the construction of the suburbs of Passaic in 1967 he described them as rising from a place with no history, no established framework, all that exists is their inevitable entropic ruination. The landscape has no past and the landscape tells of an already present future. As with Richardson's film, Smithson creates a time-shift in the landscape; describing prehistoric machine-age dinosaur diggers standing amid pre- and post-war suburban homes and highways which, among his myriad references to art magazines and science fiction, suggest a 'discredited idea of *time*' (ibid, p.72, original emphasis).

Pasts, presents and futures collapse in on one another, reorienting the landscape not to the points of the compass but through an idea of the future rising entropically into a ruin marked by Smithson's monuments[35]. His monuments are 'portals' (Dillon, 2014) into other temporalities, moving away from the fixity of socially ordered structures into new entropic forms; the bridge into New Jersey becomes the 'Monument of Dislocated Directions' that suggests the 'limited movements' of an 'outmoded world', the pipes of an industrial outflow are 'The Fountain Monument' and 'The Sandbox Monument' contains 'the drying up of oceans' and the 'dissolution of continents'(ibid, pp70-74). Entropy is an idea drawn from thermodynamics that describes the inevitable loss of energy and transition from ordered states into chaos. In Smithson's lexicon it offers a way to reimagine established relationships to predefined and structured forms.

For Smithson, entropic processes turn their attention towards the swamp, the desert, the construction site and the earth, away from that which is ordered and well-composed towards what Latour describes as a *Kakosmos* (Latour, 2014, p.4). This is a *metamorphic zone,* that pre-figures the formation of any positions of subject or object (chapter 1, p.66; Latour, 2014, pp.13-14), from which actants become known through their effects, and through their interaction an animated materiality is produced. This materiality that emerges is distinct from matter. Latour suggests that matter is the product of a conventional scientific worldview where time flows from the past to the present. This is an account in which things become de-animated, suggesting that they are 'simply caused' by that which precedes them, in an understanding that removes all *eventfulness* from them (Latour, 2014, p.13). Materiality on the other hand is formed through allowing time to flow from the future to the present. In this way it allows for 'the many occasions through which agencies are being discovered' (ibid, p.14). Approaching a landscape, a building or an oil rig, from the future rather than its past, asks questions of how it emerges *in* time rather than how it is arranged in space. It presents a way to imagine engaging with a site that moves from an idea of static objects in fixed topographies to a situation that can engage with Latour's flow from the future, and provide the conditions through which non-human agencies, and its

[35] In the essay Smithson designates selected manmade features in Passaic as monuments; a bridge, a pumping derrick, a pipeline, a water outflow into the river and a sandbox.

materiality, can emerge and become apparent.

An earlier manifestation of Scotland's oil industry that preceded the rigs of the North Sea can still be seen from the M8 motorway just outside of Edinburgh; 95-metre-high mounds of shale known locally as bings. They were formed from an oil extraction process, where tonnes of oil bearing shale were mined underground, baked to extract the oil and the remaining stone was disposed of on increasingly large heaps. This industry which began in 1851 and made Scotland one of the biggest oil producers in the world, continued until 1963 (Harvie, 2005, p.4), just two years before the exploratory rig Sea Gem made the first discovery of hydrocarbons in British waters, and showing that the North Sea could provide a viable alternative oil supply.

These bings have been drawn to the attention of the art world through John Latham's Artists Placement Group (APG) placement with The Scottish Office Development Agency in 1975-76. In this capacity Latham was asked to address what were then seen as these problematic visually troubling, heaps of industrial waste. Latham's response was to declare them artworks, marking them as 'process sculptures' and 'monuments' to anonymous labour (Hill, 2016, p88-89; Richardson, 2012, note 4). It is an idea that recognises the processes of their formation and the different temporalities within them, acknowledging that the time of their creation extends beyond the individual lives of the thousands of people whose labour produced them. The mass and scale of the bings will ensure they persist beyond the culture from which they emerged, and like prehistoric henges and hills that have preceded them in the landscape, new meanings and imaginaries will emerge from them.

Latham's practice and his writings sought to develop an understanding of the world, in terms of events rather than objects. In his publication *Report of a Surveyor* (1984), Latham argues that language is a medium that separates matter and meaning and contains them at a 'dimensionless point' (Latham, 1984, p.7). This is a division that has led to the problematic situation where the world and the description of it are 'mutually incompatible' (ibid, p.14). Language is adequate to describe objects in space, but Latham questions whether language and its logical

application through science is ‘dimensionally fitted’ to represent the structure of events because it carries no reference to the time-based characteristics of things (ibid, p15). To resolve this perceived division between mind and matter Latham proposes a movement away from a ‘framework of *Objects in Space* to one of *Event and Time’* (p.17, original emphasis), and infers that it is through the action of the artist, that art, not language, has the capacity to describe the structure of events.

Latham began to relate his theory of *Structure in Events* through his series of *One Second Drawings* (1970-75). These were created by an ‘operator’ who would spray black paint onto a piece of primed board for the duration of one second, which was then stamped on the reverse with time and details of its making. On one level the seriality and instruction based artwork was not unusual for the 1970s yet, as Walker suggests (1995, p.110), the stamping and dating begins to hint that ‘they belong to a larger historical continuum’. However, it is when we look past the macro-scale of the paintings as objects that they begin to describe Latham’s theory of structure in events. In diagrams drawn in *Report of a Surveyor* (1984, p.31) he describes the spray not as a single mark but as an emerging pattern of events that relate to each other. I have summarised below the different ‘states’ that emerge from the process (ibid, pp.30-31):

State 0 The initial a state of no extension, the blank canvas

State I The first droplet of paint strikes the surface, which Latham characterises as the smallest unit of event between action and non-action, and calls it ‘*The Least Event’*. The first point of organisation not spatial but temporal, a ‘score’, in Latham’s words, against which the rest of the event unfolds

State 2 A second particle of paint strikes the surface and a linear relation opens between the two points but one that can be measured against the score of *The Least Event*

> **State 3** A third event occurs and a triangular relationship with the first two points emerges
>
> **State 4a and 4b etc…** How the event expands now can vary and the droplet of paint can fall in or out of the existing relations state 4a or 4b - so what Latham describes as 'an ordering influence' can be seen, one derived from the *atemporal score* of *The Least Event*– that initial oscillation between 'non-extendedness' and 'least extendedness' (ibid, p.30).

Latham's interpretation shifts the emphasis from points of paint distributed on an image plane to a series of events. It is an idea that he sought to extrapolate out into a model of the universe that could expand, not from the smallest particle, like the atom, quark or boson as with scientific models, but from the Least Event. Latham's Least Event, like Negarestani's suggestion of a first 'epistemic cue' in the homogenous space of a desert (Negarestani, 2015, p.231) offers a first localised point in an otherwise undifferentiated space, and suggests a procedure through which the complexity of a global image can emerge from local contingencies. Latham's interpretation of his *One Second Drawings* does not look at pre-existing things and ask what they are produced from, but questions how things are composed *in* time and offers a generative way to imagine *eventfulness* preceding matter.

Interpreting the bings in West Lothian through Latham's ideas of *Structure in Events* offers an approach that can understand them as being more than mounds of inert matter, and presents a way of animating them as a site, that can, like Latham's *One Second Drawings*, emerge as a series of events. The billions of pieces of shale that form the bings aggregate around the Least Event of the first piece of shale that was deposited in the 1850's. Each successive shard of stone, every dump truck of the millions of tonnes of material added until the 1960's, oscillates to, and is ordered through that Least Event; an 'atemporal score' that continues to be active into the future.

If viewed from a long enough time-base the bings can be seen as autopoietic and living (Hill, 2016, p.90) and they are continuing to evolve into new forms. From

visiting the bings in July 2016, it is evident that beyond their formal designation as scheduled historic monuments, they continue to be transformed through their interactions with people, animals and plants; they are now a tourist attraction, people walk their dogs there, they are sites of biodiversity, their steep banks at the time were abundantly covered in willow herb, evening primrose and dotted with orchids. Birds of prey circled overhead and there was evidence that they are often used as motorbike raceways. These new uses of the bings, I would argue, do not make them a *post*-industrial site as places like these are often described, but a site that continues to be shaped through the score of the Least Event, one that continues to be active and remains eventful through it. By applying Latham's approaches to other sites, whether they are landfill sites, quarries or offshore oil rigs, Event Structure can inform and organise new relations to them, offering ways to imagine them as lively and animated sites emerging from events rather than simply problematic matter to be disposed of or dealt with once their initial industrial functions have passed.

Latham's reframing of the problematic bings for the Scottish Office has ensured that they remain a resonant part of the landscape of West Lothian today. They continue to take on new meanings that come from being a part of that landscape and like prehistoric earthworks or Smithson's *Spiral Jetty* (1970) they become what Simon O'Sullivan describes as 'complex myth making machines' (2017, p61), through the interrelationships they form with it. Looking at Smithson's expanded practice; earthworks, sculptures, photography, film and writing as whole, O'Sullivan describes it as a form of 'mythopoiesis', a process of 'fictioning' the landscape, 'a re-imagining of what's already there and a foregrounding of other, often non-human temporalities' (ibid, p.61). Mythopoiesis, literally story-making - like Haraway's use of the term 'sympoiesis' that she defines as 'making-together' (Haraway, 2016, p.58) - is a way of making connections, seeing the productive layering and discovering the overlaps in artworks, theories, places, people, histories and fictions. Mythopoiesis is a process that, like Latham's approach to the bings, is not about producing something new but *re-imagining* the potential of what is already there, asking how it is composed and what it could be. It suggests an approach that is more expansive and outward facing than Hill's *autopoiesis* (self-making).

This fictioning mythopoiesis can be seen in the practice of Plastique Fantastique (Simon O'Sullivan, David Burrows and others) in the performance *Bi-Son-Oil-Men* (2016)[36]. Originally presented at Peacock Visual Arts in Aberdeen, it addresses the changing industrial landscape of the city as it moves away from North Sea oil and explores possible futures and pasts that may come into being. The performers ritualistically consume '*chromakey milk'* and regurgitate it to see digitised visions of prehistoric plains occupied by roaming bison, golf courses, and beef cattle. It is a performance that extrapolates new fictions from the industrial and economic changes taking place in oil producing areas on the North Sea Coast, from which the hybrid entity of the Bi-Son-Oil-Man emerges. It is a performance that overlays multiple temporalities of ancient pasts, bodily presents and science fiction futures, to reconfigure possibilities that are foregrounded as the Bi-Son-Oil-Man is led out into the streets.

Latham's approach to the West Lothian Bings has shown that such problematic situations can successfully be understood as an animated space of events, from which new possibilities and understanding of a site can emerge. Similar strategies are now routinely applied to industrial sites on land, where gravel pits, quarries and oil fields are transformed into 'Nature Reserves'. Canvey Wick Site of Special Scientific interest in Essex was an oil refinery site[37]. Stodmarsh National Nature Reserve has been made from flooded gravel pits and collapsed coal workings and Dukes Wood Nature Reserve in Nottinghamshire is a disused oil field (which I discuss in more detail later in this chapter). However, these strategies of using nature reserves to ameliorate for the impacts of industrial activities on the environment are not currently permitted in the North Sea. These onshore examples can offer a precedent though, and later in this chapter I will argue that when they are considered alongside the evidence for the potential benefits to

[36]Documentation of the event can be accessed on the Plastique Fantasique website: http://www.plastiquefantastique.org/performance32.html

[37] RSPB who jointly manage the site claim that there are as many species per square metre in Canvey Wick as there are in a rainforest. This assertion highlights the significance of repurposed industrial sites in the ecology of contemporary landscape. https://www.rspb.org.uk/reserves-and-events/reserves-a-z/canvey-wick/

marine life that anthropogenic reefs present, then oil and gas platforms can continue to have a place in the sea.

3.1 North Sea decommissioning

Oil production in the North Sea is declining and the operators of oil and gas platforms have begun the process of decommissioning in the North Sea, with close to 2500 wells to be plugged and over 200 platforms predicted to be removed by 2025 (Oil and Gas UK, 2017, p.7). In 2017, Shell, the operator of what has been one of the largest producing oil field in the North Sea, The Brent Field[38], began dismantling their four platforms there. In a much-publicised operation, they lifted the 'topside' of the Brent Delta platform in the world's heaviest offshore lift, using the world's biggest boat, measuring the scale of the task on their website with the height of the London Eye, the length of jumbo jets and litres of paint to paint the ship, and brought it to Hartlepool where it could be seen to be recycled (Shell 2017).

Shell have learned the importance of managing public perceptions of decommissioning and the need to gain 'a social license to operate' (Evans, 2015, pp.76-79)[39] following the occupation of the Brent Spar oil storage buoy by Greenpeace activists in 1995. This action brought the dumping of offshore infrastructure to public attention and changed public opinions, sparking other protests and a European boycott of Shell service stations, with a clear campaign message; the sea cannot be considered as a dustbin (Parmentier, 1999, p.433). Greenpeace's actions prevented Brent Spar from being dumped and have guided and shaped the international agreement of the Oslo Paris Commission (OSPAR) (Jørgensen, 2012, p.58, Parmentier, 1999, pp.442-444), contributing to the 1998 amendments to the OSPAR agreement which states plainly, 'The dumping, and the leaving wholly or partly in place, of disused offshore installations within the maritime area is prohibited' (OSPAR, 1998/3, p.16).

[38] The Brent field's production peaked in 1982 with production of 504000 barrels of oil produced each day. www.shell.co.uk/sustainability/decommissioning/brent-field-decommissioning/brent-field-timeline.html

[39] Mel Evans book *Artwash* (2015) draws attention to the oil companies' sponsorship of arts organisations and suggests this sponsorship is a part of the conditions of this social license.

Both public opinion and international treaty now demand that oil companies clear up after themselves, removing everything from the sea and returning it to the condition that they found it. But as the scale of decommissioning of infrastructure in the North Sea is increasing, some people (Jørgensen, 2012; Techera & Chandler, 2015; Baxter, 2017) are starting to question if this is the best approach, suggesting that to leave the rigs wholly or partly in place, in a manner similar to the rigs-to-reefs programme that is active in the United States, may be a better solution. The arguments for this are two-fold; an economic one and secondly an environmental one.

The cost of decommissioning all of the oil and gas infrastructure in the North Sea is uncertain. Estimates range between 30 billion pounds to in excess of 100 billion pounds, a conservative estimate might be the BBC's of 50 billion pounds (Costing the Earth, 2017). OSPAR places the responsibility firmly with the oil companies, to return the sea bed to the condition it was in before their activities began. However, because of tax concessions given to the companies in an attempt to ensure fuel security in the wake of fuel shortages in the 1960's and 70's, the UK tax payer will have to reimburse oil companies between 50 -75% of decommissioning costs. In the case of the Brent Field Shell is entitled to 70% reimbursement (Shell, 6:44-6:56). In 2016 more money was paid out in rebates to the industry than came in tax receipts from North Sea oil, meaning it became a net drain on the British economy (Baxter, 2017). Baxter and others like Jonathon Porritt[40] (2017) argue that because of this other options should be explored, and suggest there are net benefits to be gained through cleaning the rigs and leaving them in place. This would save large sums of money that could be redirected into supporting the development and roll-out of renewable energy infrastructure (Baxter, 2017), would create more new jobs than decommissioning and have environmentally positive outcomes.

Oil and gas infrastructure in the North Sea provides valuable habitats for marine organisms; their structures provide *hard substrate* in the marine environment, an

[40] Porritt is a former director of Friends of the Earth (1984-90) and set up an NGO called *Forum For The Future* that advocated for a rigs-to-reef program in the North Sea and were involved in a project called the Living North Sea Initiative http://ecoeffective.biz?page_id=81

anchor for colonies of corals, tube worms and other creatures to build their colonies. When Brent Spar was brought ashore to be recycled it was found that it supported populations of the endangered coral *Lophelia pertusa*, a finding that calls into question the perceived benefits of removing rigs from the sea (Bell and Smith, 1999, p.601). Since then, there has been growing evidence that oil and gas infrastructures in the North Sea form anthropogenic reefs (Gass and Roberts, 2006, pp.549-559) and more recently evidence has emerged that suggests offshore windfarms do too (Russell et al, 2014, pp.638-639). These structures do not just provide isolated communities but form networks of interconnected populations on various anthropogenic structures across the North Sea (Coolen & Jak, 2018, p.5, p.22).

There are strong arguments, both economically and environmentally, that it may be more beneficial to leave redundant offshore structures in the sea, rather than to default to what might appear at first to be the most responsible course of action and get oil companies to clean up after themselves. To leave oil platforms in the North Sea to create anthropogenic reefs, could potentially have a wide range of benefits from habitat enhancement and enhanced fisheries to opportunities for mariculture (fish farming) and recreational activities (diving or sports fishing) (Verbeeck, 2011, p.5).

This recent evidence is at odds with the social and legislative framework set out in the OSPAR agreement that prevents the re-use of rig structures to form artificial reefs in the North Sea. The enduring message of the Green movement since the 1990's has been that changes in our environment are anthropogenic in their nature, and the work of Greenpeace activists has been invaluable in bringing to public attention the issues around decommissioning and in forcing oil companies and governments to consider the wider effects of the disposal of offshore infrastructure in the North Sea. The decommissioning of oil and gas infrastructure highlights the complexity of the interrelationships of human effects and the environment, raising questions for environmentalists and activists as well as the oil companies. When the oil and gas platforms are removed, what would be the condition that the seabed would be returned to? What is the baseline to which it should be restored? The presumption that effects of human actions can be

undone by removing the oil platforms and returning the sea to its *natural* condition is simplistic, yet this was the appeal of Greenpeace against the *dumping* of Brent Spar that went on to guide the OSPAR amendments.

The marine environment of the North Sea has been irrevocably changed by human actions since the invention of trawl fishing in the 14th century (Roberts, 2007, p.136)[41]. The development of modern fishing practices has decimated fish stocks and destroyed habitats, like reefs and oyster beds on the sea floor. What Roberts argues though, is that each successive generation of fisherman and scientists naturalises their situation - they cannot or do not remember what it was like 800 years ago - so the baseline for what is considered normal or natural shifts for each generation. This process incrementally naturalises the depleted ecosystem of the contemporary North Sea (Roberts, 2007, p.36). It is a similar argument to that of Morton who describes 'naturalness' as a 'temporal illusion' (Morton, 2010, p44). Things become equated with 'natural' because people do not notice them changing. This idea highlights the difficulties of deciding on a natural condition of the North Sea as a baseline for decommissioning, a difficulty that becomes more complicated in the context of geological time and when considering an alternative geomorphology of Doggerland; there is no nature to return to.

To understand the effects of North Sea decommissioning will demand that human activities are considered simultaneously with the millennial time of reef formation and the geological time of millennia passing. In the context of the Anthropocene new accounts of human relations to the planet are called for, where human actions are not external, *doing things to nature*, but are part of the formation of the world, part of its becoming. In the rest of this chapter I ask how arts practices have engaged with the temporality of sites and through an account of my investigation of the wreck site of the drilling platform Sea Gem, I propose ways of approaching this site, not as fixed or stable, but in a way that accounts for a process of its composition over time.

[41] Roberts evidences this through a complaint made to Edward III in 1376 requesting that he ban the use of destructive new kind of fishing gear and through further cases of documenting the detrimental impacts of trawl fishing (2007, pp.135-166). Professor Callum Roberts is a marine conservation biologist at University of York whose book *The Unnatural History of the Sea* (2007) highlights the impacts of human activities on the oceans of the world.

3.2 Many sites of Sea Gem

The idea of an offshore drilling platform being used to create an artificial marine habitat offered the potential of a site through which I could understand the complex interrelationships that would evolve over time, and converge within the *event structure* of an anthropogenic reef in the North Sea. With the OSPAR agreement currently prohibiting any offshore structures being left in the sea, there are no examples of where this has been done deliberately, so I began to look for oil platforms that had sunk in the North Sea. There are a number of examples, but most platforms are recovered and so do not offer a site to investigate. The remains of Piper Alpha that exploded in 1988 are still on the sea bed, and a rig called Ocean Prince capsized in 1968 and was never recovered. The rig that I chose to investigate though was Sea Gem that sank on the 27th December 1965 (when one of its legs collapsed causing it to overturn). It was the first rig to sink in the North Sea and so it presented the site that had had the longest time to transform into a reef, but it was also the first rig to find significant quantities of hydrocarbons in the North Sea[42]. The Sea Gem seemed to embody the whole history of the North Sea oil and gas industry, from the first discovery, through to offering a model for future decommissioning.

At first the Sea Gem offered a physical site in the North Sea, a sense of presence that had until then proved elusive in this research. It was a place that could be visited, either physically or remotely through a technological survey using sonar or a remotely operated vehicle (ROV). By accessing the site I could address the wreck's interrelationships with the North Sea through the formation of reef structures on the wreck, which could then inform discussion of future North Sea decommissioning. This site of Sea Gem, however, despite my desire to go there, remained inaccessible and offshore.

[42] Sea Gem was the first rig to find commercial quantities of hydrocarbons in the British sector of the North Sea, when it found gas in in September 1965 in what is now known as the West Sole gas field.

It was easy to locate. I was able to access the records of the UK Hydrographic Office, who record all wrecks in UK waters, through a wreck diving enthusiast website[43]. The sparse notation style text of the report states:

> 534226N, 010821E [OGB] (SHOALEST PART) USING HYPERFIX,. SWEPT CLEAR 14.8, FOUL 15.0MTRS. LEAST E/S DEPTH 15.4 IN GEN DEPTH 24MTRS. SCOUR DEPTH 1MTRS. WRECKAGE COVERS AREA OF APPROX 180MTRS N/S AND 100MTRS E/W. DCS3 HT 9MTRS. NUMEROUS SMALL AREAS OF DEBRIS LIE TO THE S OF THE MAIN WRECKAGE, BUT NONE HAVE ANY SUBSTANTIAL HT.
>
> (wrecksite.eu accessed 3/11/17)

There it was, at the coordinates, 53°42,26 'N, 01°08,21'E at a depth of between 24 and 15 metres of water. In this format though, as with the data buoy described in chapter 1, it is just a point on the map. It suggests that the rig has broken up to some degree but there is no qualitative information about the rig's transformation into a reef. Another line in the report reads, 'EXAM'D 19.3.88 BY ROV', indicating that a visual survey from an ROV had taken place. If the video had been recorded then that could offer a view of how the wreck had begun to transform in twenty-three years of being in the sea, but I could not locate it[44] and it may never have been recorded. My only other option was to conduct my own survey of the Sea Gem but this was cost prohibitive and although filled with a potential sense of action in *going there* perhaps did not present the eventfulness and the more complex temporalities of the site that other approaches had begun to offer.

Away from the material site of the wreck, other sites had begun to emerge from my research into Sea Gem, most notably Dukes Wood near Newark in Nottinghamshire. Dukes Wood is a former oil field that was operated by BP where the drilling rig of Sea Gem was constructed and tested; it was also home to the Dukes Wood Oil Museum which was established by a survivor of the Sea Gem's sinking, Kevin Topham. Another, more accessible, site had presented itself and with it the possibility of finding a context for this research, a stable place from which to address the interrelationships of the historic and social contexts of oil exploration in the North Sea. I phoned Kevin immediately and arranged a visit the

[43] Wreck Site https://wrecksite.eu/wreck.aspx?69121
[44] Enquiries were made to the BP archive held at Warwick University, and UK Hydrographic Service archive.

following week.

Dukes Wood was not what I expected, instead of offering the grounding that I hoped for, it presented further displacements. Firstly, the Dukes Wood Oil Museum had moved and was no longer within the context of the former oil field and was now located in a nearby country house hotel, Kelham Hall. This change had transformed it from an enthusiast's collection, accessible to the public, to being a stop on the *Secret Lives of Kelham Hall Tour*[45]. Topham was very affable and was happy to show me his collection that includes a trophy made from a slice of a core sample from Sea Gem's borehole which bears a plaque reading; 'Core sample from Britain's First North Sea discovery BP's West Sole Field. Drilled by the 'Sea Gem' Rig September 1965'. It is an object that seems symbolic of the sense of success that accompanied the discovery of gas in the North Sea. Even though it is nearly fifty years since Sea Gem sank Kevin did not readily want to talk about it and would quickly show me something else in his collection if I asked him about Sea Gem. It was clear that it was not going to be possible to ask him to participate in a project to explore the histories of Sea Gem.

What Kevin did want to talk about was a commemorative statue, *The Oil Patch Warrior*, that had stood in Dukes Wood to remember the contribution of American derrick men and engineers who had worked at the then top-secret oil field during World War II[46]. Somebody had attempted to steal it and had begun to dismember the statue with an angle grinder before being stopped. Subsequently Nottinghamshire County Council had removed the statue and having restored it, had relocated it to the gardens at Rufford Abbey, a few miles from its original site. Kevin was adamant that the sculpture had lost its meaning by being removed from Dukes Wood and at the very least should be located at the hotel where his collection now is and where the American oil workers were billeted during their time there. I wanted to help him, but it struck me that it highlighted a problematic literal relationship between the location of the sculpture and its meaning, similar to

[45] These tours cost £10 per person https://www.kelham-hall.com/hall-tours/ The move to Kelham Hall did offer Topham a more solid venue for his museum than the portacabin that housed it previously but in my opinion it significantly changes the way the museum can be accessed by the public.

[46] In 1943, 42 oil workers came from Oklahoma to boost oil production from the site during a fuel shortage during World War II; this made a significant contribution to keeping the British Army supplied with oil http://dukeswoodoilmuseum.com/sherwood_forest.htm

that suggested by Meyer (2000, p.24)

Leaving Kelham Hall, I made the short journey to Dukes Wood still hoping that this could provide the context for my research that I was seeking. The site is managed by Nottinghamshire Wildlife Trust and follows an established strategy of using post-industrial sites as nature reserves. BP, while still owning the land, have handed management of a part of it to the trust, where it has become a well recorded and protected environmental site, designated as a Local Wildlife Site and Site of Special Scientific Interest[47]. A greening sign provides a trail plan and a brief history of the oilfield as well as details of the wildlife that can be found there (see fig3.1). The trackway leading into the woods presented a vista over the history of energy production in the UK; nodding donkeys standing in the trees, distant clouds rising from the coal fired power station at Cottham which recently qualified to bid to supply electricity into the national grid until 2022 despite government pledges to move away from burning fossil fuels, and the nearby National Grid Training Centre at Eakring, replete with wind turbines and specially designed pylons installed as some kind of archetype for renewable energy production. With this all visible and present I felt the familiar buzz of arriving at an interesting site, and could clearly see the potential emerging from the interrelationships of an industrial site and its landscape. At the end of the track though, I did not see the portacabin building of the former Dukes Wood Oil Museum that I had expected but a timber frontage with golden letters on top that read ‘star of two sides’ (see fig 3.2). It was instantly clear that I was not the first artist to realise the potential of this site.

Another interpretation board informed me that the cladding of the former oil museum is a ‘sculptural façade’ titled *A Star of Two Sides*, produced by Folke Koebberling and Martin Kaltwasser (2013), using locally sourced timber, in a form that mirrors the ‘porous rocks and strata below’, while its title reflects the ‘dualistic relationship to oil’ that is both ‘valorised’ for its economic potentials and vilified for its ecological consequences (Ordinary Culture, 2013a) This artwork was just one element of *The Dukes Wood Project* curated by Ordinary Culture in 2013, who worked with Jo Dacombe, Alec Finlay, Institute for Boundary Interaction (I.B.I),

[47] Information about the nature reserve is available here:https://www.nottinghamshirewildlife.org/nature-reserves/dukes-wood-nature-reserve

Figure 3.1 Dukes Wood Nature Trail. Photograph Rob Smith 15 December 2017

Figure 3.2 *A Star of Two Sides*, (2013), Folke Koebberling and Martin Kaltwasser (note that the missing 'a' from the lettering)

Anne-Mie Melis, Dan Robinson, Stephen Turner and Louise K. Wilson along with Koebberling & Kaltwasser. The artists had visited the site; some had undertaken residencies, so they could respond to its socio-political significance, industrial heritage and its ecology, and they had presented new works in Dukes Wood in a series of open days, guided walks and events. Text on the Ordinary Culture website about the project describes the problematics of representing a place, and the difficulties of 'thinking ecologically' with references to both Morton and Latour (Ordinary Culture 2013b). It seemed that the project I had imagined when I arrived at Dukes Wood had already been produced.

Walking around the woods four years after the project had ended and still thinking of the project that might have been, I encountered decontextualized traces of it. Amongst the trees were information and markers for artworks that were no longer there and in Topham's collection I had seen elements of Stephen Turner's artwork without any context or information about it. With the first of the letters missing from Koebberling & Kaltwasser's work, I was left wondering how long it would be until the next letters fell off. The engagement with the site that *The Dukes Wood Project* produced was over, the artists and curators who had responded to the site had moved on, and so had Kevin's museum. The context of the project and the narratives it had created had become dispersed and yet there were physical traces of it left behind that were still attached to the 'literal site'. Although *The Dukes Wood Project* had moved beyond purely indexical relationships to the site, it had not escaped its gravitational pull.

In my investigation it seemed that for all the potential sites that Sea Gem had initially offered - its location in the sea, a possible engagement with Kevin and his archive, or producing a discursive site within the context of Dukes Wood - each physical site presented a different set of complications that did not move away from an idea of site that was prefigured in space-based ways of thinking. For my practice to engage with Sea Gem, I needed to develop a 'time-based' way of thinking in order to account for the temporal conditions of Sea Gem's site and reimagine the relationships between reef and rig, and the context of decommissioning in the North Sea.

3.3 Sea Gem 1965 - Now

Without either the specific context of the physical wreck site or of The Dukes Wood Oil Museum, I began to seek ways in which the Sea Gem could remain situated offshore and be understood in a way that could address the multiple temporalities that it suggested; its historic past, the possible futures of a reef and the present context in which its stories are encountered.

I turned to historical documents from the 1960s and in particular British Pathé newsreel footage of the Sea Gem, *Beacon of Promise* (British Pathé, 1965)[48], that documented Sea Gem at the time that it discovered gas and 'lit up' the flare at the top of the rig to check its quality for combustion. This film and two other reels of unedited footage were shot from helicopters using panning shots around the platform, so that across the reels nearly the entire structure had been surveyed from the air. Taking multiple digitised frames from these archive films, and using a process called photogrammetry, I was able to construct a three-dimensional digital model of the Sea Gem[49] (figure 3.3). The software I used, Agisoft Photoscan, was able to extract spatial data from the images by matching points in them, and comparing the differences in the relative position of those points in each frame. This process produces a point-cloud, that can be turned into a mesh and then given a texture and rendered as a very accurate spatial model in three dimensions. These models can be rotated, flipped, moved around and moved through within the software environment, but as with Di Palma's criticism of Google Maps which argues that any movement in them is illusory (Di Palma 2009, Chapter 1 p.70), and the points that make up the model are fixed in a finite grid, within a digitally created space.

As I learned the processes of photogrammetry I became less interested in the 'rendering' of the surfaces of the three-dimensional models of Sea Gem, than finding ways that the model I produced could engage with the different temporalities it seemed to present. I had begun to see the point-clouds I was producing not simply as points of spatial data fixed at x,y,z coordinates in an

[48] A preview copy of the film can be viewed here: https://www.youtube.com/watch?v=SRM3LPelhLM
[49] A point cloud of the model can be viewed online here: https://skfb.ly/6AtNY

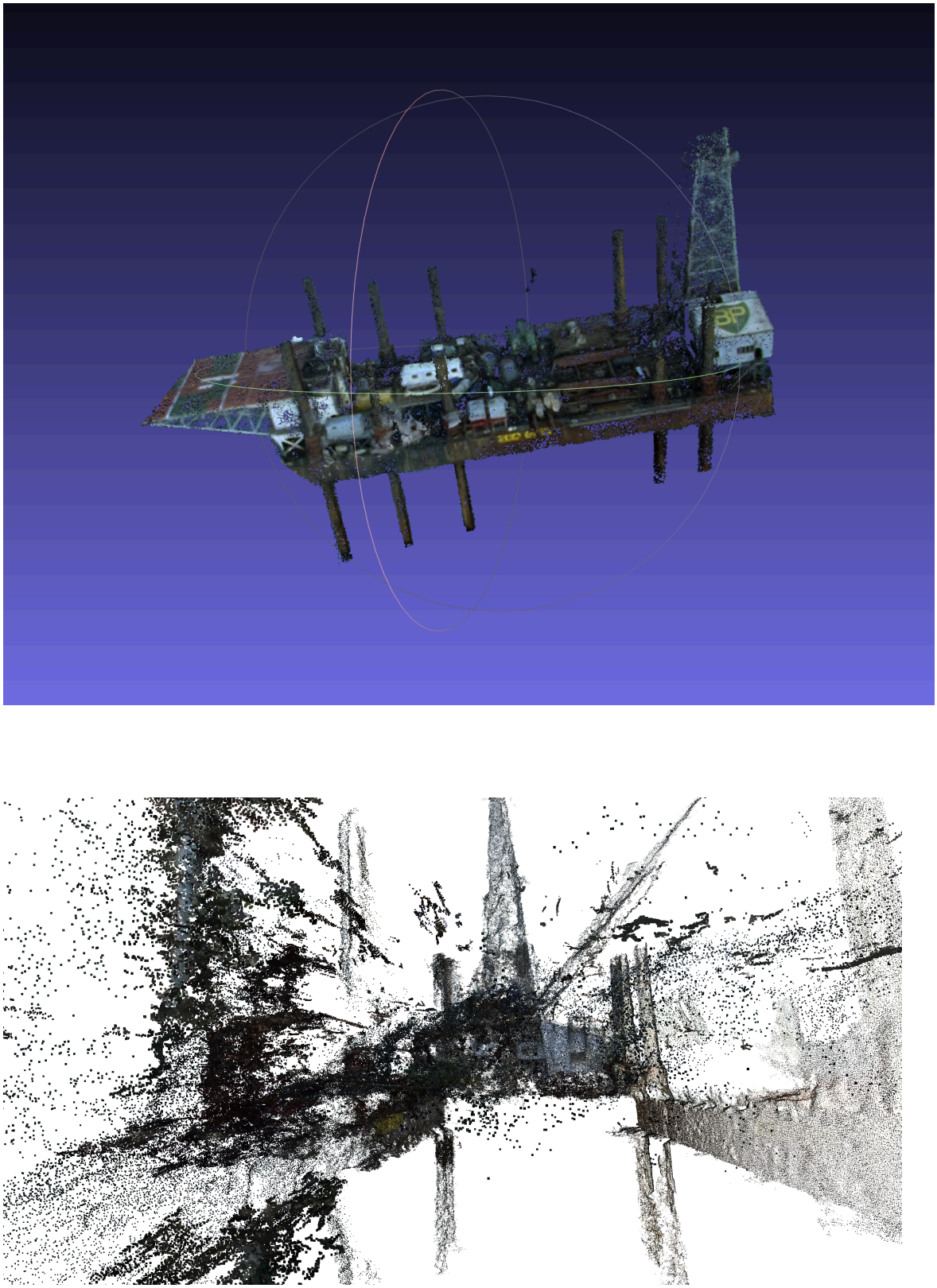


Figure 3.3 Screen Grabs of 3D Model of Sea gem created from archive film, showing mesh model above and raw point cloud below. An online point cloud of the model can be accessed here: https://skfb.ly/6AtNY

imaginary space, but also as points where many things converged, and through this process I began to understand each one as an event.

Re-purposing the archive film that had not been shot for use in photogrammetry, meant that the information I could get from the film was contingent on its originally intended purpose. The kind of information within each frame, its data, was selected by the director of a newsreel shoot fifty years ago. Each take is relatively short, and tracks between the key historical features; the name Sea Gem on the side of the rig and the flare lit up at the top, the BP logo on the flag. The collection of images that I had to work with, therefore, were not uniform as they would be in a survey made for the purpose of photogrammetry, and subsequently the points created in the model are the result of a set of particular decisions, at a particular time, to describe a particular point in history. Each point of data within the point cloud, its colour and position opens a set of interrelationships within it. Each point is a convergence of contingent events; the relative positions of the camera man leaning from a helicopter to the rig, the grain of the film stock in the camera, the light and weather conditions on that day, the archiving and storage of the films by British Pathé, the programming of the software I was using, each of these have effects that converge within every single one of the millions of points of data within the point cloud of Sea Gem.

The model produced is not a smooth or complete representation of Sea Gem, but a configuration of these points (events) that have aggregated in the model. One of the ways that I developed to record these configurations was to place photographic paper directly onto the screen which the model was being displayed on, allowing each illuminated pixel, each point of data to leave a trace on the image. These works titled *Sea Gem: Screen Contact* (2018)(Part 1 pp.17-18) were produced using different screens on which the model was displayed, from my phone to a 42” monitor. Each of these contact prints captures a different configuration of the points displayed on the screen, and in addition to this each of the different screens used presents a different set of physical conditions- dimensions, format, pixel density, brightness, contrast- that all contribute to the image that is produced. In this way it highlights the screen itself as a material site where the Sea Gem becomes composed.

On reflection however, it also became clear that this process creates an indexical relationship between the image and the screen, a one-to-one correspondence that was made particularly evident in a presentation of the work in The Experimental Studio at Baltic39, 2019. In this exhibition, a group of five Screen Contact works taken from a 42” screen were presented alongside the same monitor displaying an animated point cloud of the Sea Gem as an element of the work Sea Gem [1965-now]. Each of the contact prints fixed a singular encounter with the points of data composed from the historic document of Sea Gem onto the photographic paper at a point in time, but as with indexical understandings of site highlighted by kwon and Meyer this singular position can be problematized and expanded into more complex understandings.

Each of the contact prints is just one instance from which the larger temporal space of the work can be navigated. Each one offers a tension between its static frame and the animated digital model presented by *Sea Gem [1965-now]* (2019) (Part 1 pp.14-16) that was displayed simultaneously on the monitor in the space. In contrast to the contact prints, this work continually reconfigured the points of the model as it was redrawn across 8847360 pixels of the screen at a rate of 60 frames per second, no longer presenting a singular index but generating multiple indices that emerged during the encounter with the work.

It was this eventfulness, that I wanted to develop in the work *Sea Gem[1965-now]*, so that each encounter with the artwork would present a unique set of events, multiple points of convergence, that would change each time the work was viewed. This meant finding a way that the model could be in constant motion, and not just moving in ways that are preprogramed or predictable to the audience, like a rotation or movement activated through the presence of a viewer using motion tracking or a controller. I achieved the movement I wanted by linking the software that displayed the model to a data buoy that provides changing data about the physical conditions in the North Sea, which I used to control the position of the virtual camera that moved through and around the model. I also tracked the position of the moon relative to where the work was exhibited and used these

coordinates to continually rotate the model in three dimensions. This is a process which moves the control of the artwork away from a pre-defined programming and presents ways that agency in the work can emerge from other actants in the North Sea.

The archive film was presented on a monitor alongside the projection of the moving point-cloud of Sea Gem that was created from it. This was a decision that I made to directly address the historic aspects of Sea Gem by bringing the film into the unfolding time-space of the work. In order to create a connection between the film and the model the playback speed of the British Pathé film is linked to the movement in the model. As the movement increases so does the playback speed and vice-versa[50]. The effect is such that the soundtrack of the film, a triumphalist monologue narrating sea gem's discovery, shifts erratically in pitch, moving between almost sub-sonic rumbles and drawling, through to normal pitches and then to comedic squeaks. It presents an audible soundtrack to the changing projection of the model and continually re-presents the archive footage as each loop plays out at varying speeds, oscillating between time-lapse and slow-motion in a new patterning each time.

These processes within the work result in a continuously changing movement that pushes and pulls through the points that compose the point cloud of Sea Gem in unrepeatable patterns. Each time it is viewed the work is different. It gives the work its own timeframe, but not one of fixed duration defined by a start or end, but one that is generated in time when the work is presented. Similarly, John Gerrard's computer-generated sites offer an alternative temporality, one that he describes as presenting a different perspective from fixed duration cinematic time[51]. His works endlessly orbit models of automated pig farms and nodding donkeys not in a sequence of frames like a film, but instead these models and the landscapes they occupy are generated from a set of data instructions in time (Gerrard, 2015, p.67).

[50] A video documenting the work can be accessed and makes clear the changes in the audio track: https://vimeo.com/307037882/e783a49229

[51] When I first encountered Gerrard's work *Sow Farm (Near Libbey, Okalahoma)* (2009) at Tate Britain in 2015, I watched it for a long time waiting for the moment that it would loop before I realised that it would not. It is generated in the computer at that point in time; the work does not run from beginning to end like a film.

Gerrard's works do not just render representations of structures in a landscape but they meticulously model entire worlds for them, creating their own time-spaces where the sun tracks across the sky from sunrise to sunset, virtual stars are aligned with the sites, and seasons pass, creating their own temporality within this landscape.

I have added one further layer of temporality to *Sea Gem [1965-now]* which means that experiences of it can never be repeated, and the work will continue to evolve into the future. Each day the scale of the point cloud is determined relative to the 27th of December 1965, the date when Sea Gem sank and the date when the artwork was first programmed; 14th June 2018. The date in 1965 operates as a point of *least-extension* for the point cloud, where all the points of the model are condensed into a singular point like Latham's Least Event and the date in June 2018 presents a time at which the model is scaled to 100%, the size at which the model was generated. The rate of the increase in scale is calculated between these two points and continues to increase at that rate. This results in the scale of the model increasing each day, and the points within the cloud becoming more spaced out over time.

When I last ran the software in November it had reached a scale of 110%. Next year it might be 150%, in 5 years time it could be 400%, and so on. Although the arrangement of the points do not change relative to each other, they disperse within the digital space of the programme, meaning that the overall form of the rig will become less distinct and the effects of the wave data and the camera's movements will become less significant. I can imagine a time much further in the future where the points become so dispersed that the form of the Sea Gem is lost entirely and the points just float relative to each other, while the position of the camera will move indistinctly between them. At this point the playback of the archive video will have almost completely stopped and might change to the next frame once a week. Even though the movements in the work will seem to have stopped, the work will continue to be temporally active.

These mechanisms used in the programming and design of the work meant that there was not one singular experience of it, as it moved away from an indexical

relationship with the model and the work becomes differently composed for audiences depending on *when* it was encountered. At times the form of model would be readable as an oil rig but at others it would appear reef-like or only as a vague constellation of points. Similarly, the archive newsreel would sometimes be comprehensible providing an informational context to Sea Gem but at others could equally be transformed into noise, accompanied by nearly static and abstracted frames from the film. In this way the site of the Sea Gem assembles within the eventful space around the viewer's encounter with the work. The audience is drawn into the assemblage of actants along with the wreck itself, the film, the wave data from the North Sea and the moon. It is from the convergence of all of these things that the site of the work emerges. By allowing all of these things to remain animated within the work, the site of Sea Gem is composed and recomposed in the eventful space of the artwork each time the work is encountered.

3.4 Conclusions

The site of the Sea Gem that emerges within these works is composed from millions of points of data, *events* that are presented in ever changing configurations and from which the work is formed. The encounter with the work is one that cannot be entirely understood through its relationship to human histories or by being present at a singular site but demands to be understood through its eventfulness and transformations in time. It creates a situation where pasts, presents and futures overlap in the '*fictioning*' of the rig; not a singular, distant place but one that emerges in the convergence of audience, data buoys, lunar orbits, archive film, projection, sound and all of their transformations. The relationships that emerge within the work do not present a configuration of objects in space - either as representation or an actual place - but present multiple sites of convergence, events that are composed in time.

This move towards an event-based way of thinking about sites proposes ways to reimagine the transformation of rigs-to-reefs through their eventfulness. The current requirement for the disposal of oil and gas infrastructure presents a

narrative of environmental pollution and dumping of industrial waste in the sea. But to consider the rig and the sea together as part of the same event, does not differentiate between the human and the nonhuman but asks what new possibilities might emerge from events in time. As with Latham's bings, an anthropogenic reef would become a site animated in time, a site that is able to compose new stories and present new situations that can inform productive understandings of human relations with the North Sea rather than presenting it as separate from human histories.

The context of the Anthropocene demands that there is a new account of human relations to the planet, and a reconsideration of how human effects are understood when human histories are brought into proximity with geological time. To approach these different temporalities through the event structure of an anthropogenic reef develops ways that an arts practice can simultaneously address their different timescales and suggests approaches that could inform an alternative narrative of North Sea decommissioning.

4.0 Conclusions: Composing Doggerland

The explorative practice that has led this research establishes an understanding of Doggerland that becomes known through its composition. Doggerland does not offer a unified account of its inundation or a singular rendering of its topography that now lies hidden beneath the waters of the North Sea. In the absence of a stable or consistent phenomenological site to respond to, this investigation has reflected on methodologies and practices that address the North Sea as an assemblage, enabling me to develop original understandings of a distributed site that is composed from multiple points of convergence of human and nonhuman actants within it.

The material conditions of the North Sea obscure direct observations of Doggerland and confound any possibilities of locating it in a specific site or of being present at a particular location. Even the most accessible sites of Doggerland, the stumps of the *Submerged Forests* first highlighted by Clement Reid (1913), which can be found along the beaches of the East coast[52] only appear momentarily to disappear again with the tides, before they are buried and made inaccessible in the churning wrack of the intertidal zone. Doggerland then, cannot be approached as a singular landscape waiting to be discovered beneath the waves. Any knowledge of it has necessarily needed to be constructed from multiple sources and indirect material traces; in pollen samples from bore holes, through chance finds of harpoons and mammoth bones or piecemeal seismic scanning of the seabed made prospecting for oil and gas. It is then only through processes of gathering, analysing, inference and interpretation that Doggerland is composed.

As a composition Doggerland moves from the singular to the multiple. It no longer offers a specific site to respond to, the spatially bounded 'literal site' problematized by Meyer (2002) and Kwon (2004), but emerges unpredictably across many sites at different scales, forming within the interrelationships of the animated, lively,

[52] one such site that I have visited during this research is Low Hauxley beach in Northumberland where petrified remains of trees appear through the sand and footprints of prehistoric people can be found in layers of peat before being washed away.

materialities of Doggerland. As with Bennett's (2010) example of the blackout highlighted in the introduction, the effects of vibrant material actants in the assemblage of the North Sea become distributed across multiple sites. In this research these have manifested themselves in the motion of the sea - in waves and the tides - but also in server racks and satellites, in a woodland in Nottinghamshire, through colonies of corals inhabiting oil rigs, in my bedroom at home, in the movement of electrons between bags of salt water and the flow of water through my camera. Each of these instances becomes a site of Doggerland, a temporary point of convergence within the assemblage of the North Sea, where histories, data, materials, locations, desires, technologies, human and otherwise meet and affect each other before being recomposed in new forms. By offering multiple alternative sites of Doggerland, the practice leading this investigation presents a methodology for engaging with the assemblage of human and nonhuman actants from which its sites are composed. It is an approach that allows Doggerland to expand beyond the spatial limits of early 21st century coastlines, to become a speculative proposition through which this research has imagined new compositions, geomorphologies and fictions within the assemblage of the North Sea in the contemporary situation of the Anthropocene.

Today's North Sea does not present a more stable or accessible site than the land that is now submerged beneath it, and as such it continues to offer a context through which to explore the animated exchanges between land and sea. However, in addition to the processes of rising sea levels and glacial rebound that led to the inundation of Doggerland 8000 years ago, human actions are now accelerating the geomorphic changes that are continuing to shape the North Sea and so the future compositions of Doggerland. In the context of the Anthropocene and the current 'climate emergency'[53], it is increasingly important that the North Sea is not understood simply through a quantitative frame. It cannot be reduced to a spatial entity surrounded by land, or an increasing volume of water that

[53] on the 1 May 2019, MPs approved a motion to declare an environment and climate emergency in the wake of actions by Extinction Rebellion, UK School Climate Network and activists like Greta Thunberg. Although not legally binding it recognises a consensus in parliament of the urgency required to address the effects of climate change and laid out an ambition for the UK to meet net-zero carbon emissions by 2050, as opposed to the 80% reduction previously agreed.

threatens terrestrial societies, but it demands to become known through the vibrant assemblage of human and nonhuman actants from which it is composed. Human actions are having increasing effects within the assemblage of the North Sea; from the expansion of offshore wind generation, busier shipping lanes, industrial fishing practices, the designation of Marine Conservation Zones designed to protect biodiversity and the continued extraction of oil and gas. Each of these examples raise issues that emphasise the complexity of the interrelationships which are active in the continual forming of sites in the North Sea. By approaching the North Sea through its composition and allowing the effects of the vibrant material actants at play within it to emerge across a distributed array of sites, my practice offers a speculative methodology to consider the impacts of this increasing human activity in the North Sea, while creating new compositions- sites- that generate alternative positions from which to investigate the complex and animated interrelationships within it.

This research began to address the complexities of the assemblage of the North Sea by complicating the undifferentiated and flattened cartographic representations of it. As I have argued (pp.36-39), both paper maps and digital interfaces used by GPS systems and Google maps, present abstractions that reduce the sea to a quantitative spatial representation that does not account for its material qualities such as depth, motion, and capacity for change. By seeking difference within this uniform space the work *NorthStudioMoonSea* (2017) expands the spatial limits of the artwork through engaging with multiple geographic locations that are active in informing understandings of the North Sea as an assemblage. Server racks in data centres, satellites, the moon, the places where I collected sea water from are just some of the locations that form the distributed topography of the work, while the heterogeneous array of objects that formed the work in my studio, the bags of water, computer screens, projectors, backdrop paper, trolleys, cables and the electrons that move along them all contribute to the work's composition at different scales. It is an artwork that creates an increasingly complex network of locales and shifts understandings of its spatial limits, both internally and externally, from a locally limited site to incorporate an increasing array of multi-scalar actants within the assemblage of the North Sea.

Through this differentiation, *NorthStudioMoonSea* presents a hybrid approach to site, a confederation of heterogeneous things, human and not, akin to the vibrant actants of Bennett's *glove-pollen-rat-cap-stick* (Bennett, 2010, p.5). The material actants in the assemblage of the North Sea become apparent across different locations, and through their effects they become present and active within the composition of the work. As the North Sea becomes known through a distributed network of sites and moves away from a singular locus, it de-centres the artwork, myself and the studio within this assemblage of other actants. This situation meant I could no longer hold onto an illusory position as an objective observer, onshore looking out to sea, but needed to acknowledge I was a part of the assemblage of the North Sea that this research was addressing and so an active part of its composition.

It is these relationships to the North Sea that I began to chart in the work *Brent Field Navigation* (2017). Each of the images collated in the work became a record of where I was located and the local contingencies of that place, relative to the position of the Brent oilfield and the material conditions of the sea at that time[54]. Accessed through a website the work presents these images through a set of geo-located *pins* on a customised Google map where all traces of land have been replaced by the uniform blue of the sea. These *pins* map out a series of points within this otherwise undifferentiated blue space, offering a relational topography that expands further when viewers click on the pins, unpacking the multiple locations within it. (pp.73-75)

What emerges is not a smooth topography of the North Sea but one that expands through its internal differences as well as its external relationships. Each local point on the map opens onto new actants, and offers new associations and affiliations between them. Each image becomes a point through which both a local site and its global relations are composed through the encounter with the work. As such the sites that emerge are not spatially limited, static locations, but they

[54] Live wave data from the Brent Alpha oil platform was accessed each time an image was uploaded to the project website and incorporated into the metadata of the image file using a server side php script.

become, as Negarestani (2015) suggests, generative positions from which to navigate a hitherto unknown global situation, from which knowledge of that situation can be produced.

This developing understanding that the North Sea is not located exclusively offshore but is distributed across multiple local sites that contribute to a wider knowledge of a global situation, is an enquiry that I expanded further by investigating the development of underwater photography and considering the ways in which technologies used to access remote sites are also an active part of their composition. By revisiting William Thompson's first underwater photographic experiments (1856) and through my own experiments with underwater pinhole photographs (*Instances of Drift* 2017-18, pp.20-22), I encountered situations where the material conditions of the sea tested the limits of visibility and visual representation. In both cases the conventional indexical relation between object and image becomes submerged in the complexity of the churning material assemblage of the sea and is, I suggest, better understood as a point of convergence (Anderson, 2014); a site that emerges in the meeting of the photographic apparatus and the material conditions of the sea.

The photographic images that I produced, like Thompson's collodion plate, did not render a clear representational image that provided a technological access below the surface of the sea. Instead each image offered a site through which the effects of different actants in the North Sea became apparent. Each of the sixteen images produced for *Instances of Drift* is composed through a unique set of events and different material effects of the assemblage of the North Sea as it moved through and around the apparatus of the camera producing the images.

To further investigate how technologies and methods of representing the North Sea are an active part of its composition, I undertook a Co-ordinate Remote Viewing (CRV) session, working with the artist collective AAS, targeting a data buoy that was transmitting live wave information to Cefas, a governmental agency who monitor the North Sea. (pp.92-94) The CRV session was organised so that the live information from the data buoy could be monitored while the site was

visualised by the Remote Viewer. However, it was not my intention to test the validity of remote viewing as an accurate surveying method but it was a process that allowed for an exploration of the technologies used to monitor this remote site in the North Sea, the networks involved in connecting with it and the role of interpreting data in its representation. Neither the methods used by Cefas or the remote viewer suggested that the data buoy was a remote or disconnected site but both their methods drew it into proximity with a meshwork of human and nonhuman actants. Both representations of the site began to expose the multiple ways in which they are constructed, from the technologies they employed, the satellites and the connectivity of the internet, to the buoy itself, all connecting back to the movements of the sea and both interwoven with the intentions, policies, biases and interpretations of the people involved in drawing them together.

Representations of the sea, whether they are produced through CRV, a network of data buoys, sonar or underwater photography do not offer objective descriptions of what lies beneath the surface but they are composed in the convergence of technologies, histories, people, locations with the materiality of the sea. To understand them as composed in this way, rather than returning to the binary positions that Latour (2010, p.474) is critical of - constructed or not constructed, human or natural - can offer distinctive new narratives for interpreting human relations with the North Sea at the time of the Anthropocene. By asking how things are composed, a site can be understood as emerging from a temporary convergence of material actants; a productive site of interaction where new compositions are continually formed. It is a proposition that suggests that there is not a single composition of the North Sea, Doggerland or the anthropocene but that there are multiple compositions that are formed within sites of convergence that can produce new knowledge and understandings of them, before being recomposed again and again.

The artwork *Sea Gem [1965-now]* (2019) reflected this movement away from an understanding of a site as a pre-existing spatially limited entity, to one that is composed of multiple actants that emerges in time. It is a work that produces multiple points of convergence through which the now shipwrecked drilling rig Sea Gem becomes apparent (pp.120-124). The work offers new narratives through

these ideas of composition, that support a re-evaluation of strategies for the decommissioning of North Sea oil and gas infrastructure in the future.

Referring to the practice and ideas of John Latham, I argue that to consider the decommissioning of rigs in the North Sea through a temporal frame of time and events, rather than a spatial frame of objects in space, provides an approach that does not differentiate between what is human or nonhuman, manmade or natural. Rather than making binary divisions, an event based approach can apply to all things as they become known through their effects. As such this methodology offers ways to reconsider the established binary positions set out by OSPAR and supported by environmental campaigners, that currently define approaches to decommissioning.

The OSPAR agreement that governs the disposal of offshore infrastructure demands that all oil and gas infrastructure should be removed from the sea, to return it to its original condition. This is a stance that mirrors the attitudes of the Scottish Office to the West Lothian bings in the 1970's which Latham addressed during his Placement with the Artists Placement Group (1975-76). At that point in time the bings were viewed as derelict land, problematic waste matter that needed to be cleaned up. Latham offered an alternative approach, reconceptualising them as artworks, monuments to the labour that produced them. This radical approach is one that now seems vindicated by how the bings are viewed today, recognised as heritage sites, valuable conservation areas and a productive part of the Scottish landscape.

Similarly, to approach a redundant oil rig in the North Sea, not as industrial waste that needs to be removed but as an eventful and generative part of the environment as it changes into a reef, can present alternative approaches to these sites that begin to address the complexities of their composition and reflect their capacity to change over time. This requires that they are understood as a part of the North Sea, and not separated from it by fixed ideas of what is natural and what is not. By considering the speculative sites of anthropogenic reefs on a time scale that exceeds the meso-scaled thinking of human time, my artworks propose alternative narratives that emerge from these sites that can inform new

understandings of offshore infrastructure and address the scale of events suggested by the Anthropocene.

Doggerland continues to be recomposed. As the decommissioning of oil platforms gets underway and the rigs of the iconic Brent Field are being brought ashore to be dismantled, the North Sea is becoming a new frontier for meeting the energy needs of Europe. An increasing number of large scale offshore wind farms are being built and a new plan for the North Sea Wind Power Hub (NSWPH) proposed by a European Consortium of companies is now set to dwarf them all, in a project that will see Doggerland re-emerge once more from beneath the North Sea (NSWPH accessed 2nd August 2019). This scheme proposes to construct an artificial island, which by 2030 will act as a hub for some of the biggest offshore electricity generation projects in the world. This new land in the North Sea simultaneously offers a hope of decarbonising energy production to mitigate for the effects of anthropogenic climate change but also draws attention to the scale at which human technologies are effecting the planet and to our species' capacity for geomorphic change. This artificial island highlights the ways in which human actions are becoming more entangled with the North Sea, and offers further opportunities to understand how sites are composed within this, as innovations in technology enable industry to move offshore. The structures and islands put into the sea by the wind energy industry, like the oil rigs that preceded them, will become a part of the ecology of the North Sea. They will form new habitats and reefs, effect shipping routes and fishing practices, and at some point they will need to be decommissioned. As such, these structures will require new accounts of the complex interrelations which emerge around them, and it is in this context that this research contributes to the understanding of these future compositions of Doggerland.

It is not just at sea that the processes of Doggerland's continual re-composition become apparent. One of the most visible effects of anthropogenic climate change is rising sea levels and many people in low lying coastal regions are already aware of its impacts. Sea level rise is accelerating globally with increases in mean global temperatures and the consequential melting of icecaps and glaciers (IPCC, 2019,

pp.10-11). In the UK the Committee on Climate Change (CCC), an independent advisory committee to the UK Government states in a recent report that 'it is almost certain that England will have to adapt to 1m of sea level rise' (CCC, 2018, p.9) and that there are indications that this will happen in the life time of children today. They estimate that over a million people in the UK, even in the best-case scenario, will be affected as the effects of coastal flooding and erosion will be exacerbated (ibid, p.11). At a cost of over 260 million pounds annually the report suggests that current approaches to coastal management are 'unsustainable' and calls for alternatives to current 'hold the line' strategies (ibid, p.60). To understand the North Sea as an assemblage as I propose, offers methods to re-evaluate and adapt to the changing relationships between land and sea, and contributes ways to reimagine the changing composition of our island in the context of the Anthropocene.

The methodologies I have developed also have potential applications in understanding the complex sites that emerge from human entanglements with the planet, beyond the sea. In the context of the Anthropocene, there are an increasing number of sites that, although not changing with the speed of the sea, still demand eventful accounts of the interrelations from which they emerge. Digital networks now operate at a planetary scale, transferring data across continents at speeds measured in milliseconds, while nuclear waste storage facilities like those in Onkalo in Finland[55] will need to store their contents for 100 000 years before it is safe, longer than the modern humans have inhabited the planet. These examples highlight the contrasting temporalities that are emerging from human interactions with the planet on a geological scale, and they emphasise the need to generate new narratives that can account for their complexity beyond a purely spatial framework.

Since Crutzen and Stoermer (2000) proposed that we are entering a new geological epoch at the start of this century, discussion of the Anthropocene has expanded beyond the field of earth sciences into an interdisciplinary field of

[55] The issues of communicating the dangers of nuclear waste storage in relation to the Onkalo site are described very effectively in the film *Into Eternity* (2010) directed by Michael Madsen

research, offering hybrid narratives for understanding human interrelationships with the planet. It is within this expanding context that this research contributes to the multiple narratives of the Anthropocene, and offers distinctive methodologies to address Doggerland and inform human interactions with the North Sea in the future.

Through this investigation, I have developed original approaches to site based practice that further expands the ‘informational’ and ‘discursive’ models of site developed by Meyer and Kwon respectively. By repositioning nonhuman materialities, as lively actants in the composition of site, this thesis contributes an understanding of site that emerges within the complex interrelationships of human and nonhuman actants in the assemblage of the North Sea. The multiple sites of Doggerland that have been composed through this research have become unmoored from their spatial limits, presenting a methodology through which a site is not a limited local context but becomes a generative position that can inform the histories, geomorphologies, fictions and futures of Doggerland as it continues to be recomposed in the context of the Anthropocene.

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